

# The Boston Medical and Surgical Journal



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## The Massachusetts Medical Society.

### THE SHATTUCK LECTURE.\*

### THE TREATMENT OF DIABETES MELLITUS.

By ELLIOTT P. JOSLIN, M.D., BOSTON.

#### WILL THE DURATION OF DIABETES CONTINUE TO INCREASE?

THE average known duration of the fatal cases of diabetes in the city of Boston between 1895 and 1913 was 3.3 years; during 1915 it was 4.3 years, and in 1920 it was 5.3 years. No published statistics show better the improvement which has taken place in the treatment of diabetes in the last decade. This improvement is to be credited to the efforts of the average Boston doctor. An analysis of my own series shows similar results. Thus, prior to June, 1914, the average duration of life of my fatal cases was 4.8 years, and since June, 1914, it has been 6 years. Can this improvement go on? Can the present treatment, that is, particularly the dietetic, progress still further? It is the purpose of this lecture to prove that this is possible as well as probable, to indicate how this can be brought about by private and public endeavor, and, more impor-

tant still, to explain how even the disease itself to a large extent can be prevented.

Returning to the increase from three to five years in the duration, it can be said that it is illogical to expect this steadily rising curve abruptly to change direction. My own statistics appear less striking at first glance, but in reality are quite as convincing. (Table 1.) If one closely examines the duration of life in the individual decades of onset, it will be found that in the first, which is the decade in which diabetes has been considered to be most severe, the duration has actually doubled. Again one can say that such an upward curve is not likely all at once to flatten out. Reasons for so great an increase in this decade may be that though the disease in these little patients is more severe, they are the ones upon whom the most energetic therapeutic efforts are expended, and possibly expended earlier in the course of the disease because of more timely diagnosis. This earlier diagnosis does not invalidate the statistics, because the duration has invariably been computed from date of onset of symptoms rather than from date of diagnosis. These two factors, the probability that a steady curve of increase will continue and the remarkably great increase in duration of the severest type of cases, are overshadowed by a third, namely, the length of life of those cases who have actually lived beyond the average period.

\*Presented at the Annual Meeting of the Massachusetts Medical Society, Boston, June 13, 1922.

This number of diabetic individuals who have lived in excess of the space of years attained by my entire group of fatal cases is

TABLE No. 1.—Duration of Life in Fatal Cases of Diabetes Arranged in Decades Before and After June, 1914.

Decades of Onset Years	Before June, 1914		After June, 1914	
	No. of Cases	Duration Years	No. of Cases	Duration Years
0-9	25	1.2	47	2.7
10-19	35	2.9	89	3.3
20-29	80	3.9	162	5.3
40-49	137	6.9	216	8.1
60-69	80	4.5	108	6.1
0-69	351	4.8	597	6.0

considerable and can be instructively demonstrated in several ways. Thus, in Table 2 are 97 cases, of whom 7 in the first decade lived beyond 5 years, 10 in the second beyond 6 years, 26 in the third and fourth beyond 10 years, 36 in the fifth and sixth beyond 15 years (which is within 6 years of the average expectation of life for their decades), and in the seventh decade there were actually 18 who reached or exceeded the average normal expectation of life for this period. In Table 3 are shown 79 cases (23 per cent.) out of the total number before 1914 who lived above the average period of 6 years, which was that for the cases after 1914, and 186 cases (31 per cent.) out of the total number since 1914 who did the same. If one examines the table by individual decades it will be found without exception that the percentage surviving the 6-year average was greater in the later than in the earlier series. The range of duration for all the fatal cases before and after June, 1914, is shown in Table 4.

Regrettably it must be acknowledged that even in recent years some cases have died within a few weeks of onset. These are the deaths which must be eliminated if the average duration is to be strikingly increased, and fortunately

TABLE No. 2.—Fatal Cases of Diabetes of Unusual Duration.

Decades of Onset Years	Duration over Years Specified Below	No. of Cases
0- 9	5	7
10-19	6	10
20-39	10	26
40-59	15	36
60-69	11	18

nately this is an easy task. The figures which show the maxima of duration raise our hopes.

The results portrayed in Tables 2, 3 and 4 are the encouraging averages which we should

all try to reach with our cases. The general averages are such because of poor treatment; the higher averages represent better treatment. This is not all that may be expected, because the treatment which has led to this improved duration was the type of treatment of a decade, more or less, ago. Furthermore, no attempt has been made to include living cases, which, if it was done, would swell the figures still more. In the light of our present knowledge of diabetes who will venture to predict the life of the patient who develops the disease today?

In 1913 the writer published a paper with the title of "Diabetic Standards."\* Of the eight cases cited at that time all outlived the present average duration for corresponding decades of onset, but it is perfectly obvious that there are three of the number, Cases Nos. 10, 74 and 354, in the earlier decades, who could be replaced easily by many others today who have lived for longer periods of time and were originally more severe. It is also plain that (1) what was termed severe diabetes in 1913 would be moderate diabetes today, (2) that the patients, though carefully treated, were not long sugar free, and (3) that acidosis was present in three-fourths of the cases. Today one would hesitate to publish as a model a case with sugar in the urine, and would never include in the list one with acidosis.

#### NEEDLESS DIABETIC DEATHS.

The needless mortality in diabetes is unfortunately greater than we realize. All classify as accidental the death of the little boy, Case No. 1266, following collision with an automobile while sliding down hill, but it is not so well understood that there are many other accidental deaths. The task is a melancholy, though always instructive, one, to study the causes of death in any disease, but particularly in this true of diabetes. Patients who have pneumonia, tuberculosis and cancer usually die of pneumonia, tuberculosis and cancer, but diabetes seldom die of their disease *per se*, but of complications which are universally recognized as largely preventable—coma, gangrene, infections. Deaths from inanition in diabetes represent more nearly the disease itself, though by no means is this the invariable rule. And it is because these complications are preventable that it is profitable to study them, to investigate why they occur, to point out how they can be avoided, and thus to prolong the life of the diabetic. In a way this attacks the problem in a negative rather than in a positive way, but this method has and will continue to produce useful results, and indeed constitutes a fourth reason for believing that treatment will continue to improve.

\*Amer. Jour. Med. Sci., 1913, 145, p. 474.

Table No. 3 Percentage of Fatal Cases and Average Duration of Coma Who Outlived an Average Period of 5 Years. Arranged by Decades for the Periods Before and After June, 1914.

Decade of Onset	June 1914					
	Before			After		
	Cases	Average Duration		Cases	Average Duration	
	No. of All Cases in Each Decade	Percentage in Decade	Years	No. of All Cases in Each Decade	Percentage in Decade	Years
0-9	0	0	0	3*	8	7
10-19	3	8	10	7	10	8
20-29	3	9	20	15	14	12
30-39	11	24	9	30	38	10
40-49	24	21	13	50	50	11
50-59	37	47	11	72	57	11

\* Case No. 897 is omitted as the duration of life was 33.7 years.

Coma is the chief complication, and coma cannot be otherwise than largely preventable. Indeed, I will go so far as to say that the diabetic who dies of coma uncomplicated by infections dies needlessly. One per cent. of the cases at the New England Deaconess Hospital die of it, and it constitutes but one-third of the total deaths. Outside of the hospital the majority of diabetics succumb to it. When coma does occur in a hospital it is seldom *de novo*; the patients enter either with it or in a stage of severe acid poisoning. The marked reduction in the diabetic death rate in hospitals is almost entirely due to the prevention of coma. That nearly all diabetics who die in the first year of their disease die of coma is good proof that it is avoidable, because the first year of the disease should be the safest.

Anyone who sees or has reported to him many deaths from diabetic coma becomes ap-

palled at their needlessness. A boy, Case No. 2090, is told to eat everything and in two days is in coma. A diabetic, Case No. 44, goes on a drunk, and as he emerges from alcoholic coma he lapses into diabetic coma. Deaths like these are not far removed from manslaughter and suicide. Another diabetic boy, Case No. 1870, amenable to treatment, drops out of medical supervision, coma appears, and he dies in the tenth month of the disease, though from other cases it is reasonable to conclude he could have lived at least five years. Two young adults, Case Nos. 2389 and 2401, refuse to submit to dietetic treatment and die respectively in seven and six months after the onset of the disease. Deaths like those just recounted can be traced to the advice of the laity or irregular practitioners, and often to the patients themselves. For all such deaths one feels regret, but not the keen concern excited by deaths under trained supervision, yet not quite free from errors of judgment. All these deaths most commonly occur when the diet of a patient is suddenly changed. When the carbohydrate is restricted and protein and fat simultaneously increased, death from coma may take place the same week. How many such cases! Nearly all of us have one or more such sorrowful deaths to our discredit. It is therefore well to hold to the rule in severe, long-standing, complicated, obese and elderly cases, as well as in all cases with acidosis, to make changes in the diet gradually and not suddenly or radically.

Nearly all cases of coma following alterations in diet can be traced to overfeeding with

Table No. 4.—Range in Duration of Fatal Cases of Diabetes Before and After June, 1914.

Decade of Onset	Range in Years	
	Before 1914	After 1914
0-9	0.05 - 6	0.3 - 34
10-19	0.1 - 21	0.5 - 18
20-29	0.3 - 36	0.1 - 30
30-39	0.8 - 13	0.3 - 37
40-49	0.3 - 25	0.5 - 22
50-59	0.3 - 20	0.5 - 24

fat, combined with diminution of carbohydrate. Sometimes the fat is taken in obvious excess, as happened when a diabetic, Case No. 1511, of long duration, living with little dietetic restriction, went to a fashionable hotel, suddenly decreased carbohydrate and made up by indulging to the limit in *tarded* mushrooms. The same result occurred when a fairly well nourished but severe diabetic, Case No. 310 of former days, 1910, who had frequently shown acidosis, was taken seasick on a steamer, retained no food, lived on her own fat and secured insufficient carbohydrate from the breakdown of body protein to prevent coma. Remember that a little carbohydrate as such goes a long way toward preventing coma in a mild or moderately severe case of diabetes, because it is helped by that other carbohydrate formed from protein; but in a severe case when even carbohydrate from protein is not well tolerated, and the high protein is also contraindicated because of its stimulating action on the metabolism, beware before you expose a diabetic to a high fat diet, whether endogenous or exogenous.

Then there are the cases of coma resulting from operations with ether as an anesthetic. If you do wish to use ether it is a good plan to be as rapid and as skilled as the Mayos and to use as little ether as their anesthetists. Gas and oxygen and spinal anesthesia have been shown to be so superior to ether that in the larger hospitals in Boston it is not the custom to employ it in operations upon diabetics. While operation in a properly prepared diabetic has ceased to cause alarm, one does not seek recourse to surgery unless indication is clear, because even after the successful removal of a fibroid with gas oxygen anesthesia a patient may, though by no means always, lose tolerance for carbohydrate. (Case No. 2174.)

The sudden introduction of fasting combined with alcohol in liberal quantities may lead to anuria and death in diabetics with susceptible kidneys. Such patients appear to die too soon for actual coma to develop. (Case Nos. 1015 and 2546.)

Next to coma as a preventable cause of death stands gangrene. The chiropodists know the dangers of infections in diabetic feet quite as well as, if not better than the physicians, but the unfortunate patients do not. In the first place, injuries to the feet should not occur. Never allow one of your diabetic patients to develop gangrene ignorantly. Your warning and admonition should penetrate so deeply the souls of your cases that if such a catastrophe should ever occur the unhappy patient will feel compelled to say: "Doctor, you warned me about injury to my feet, about the dangers in cutting corns, toe nails, about blisters from

new shoes or old shoes with poor linings, about nails in my shoes, flat foot plates and hot water bags. You are not to blame for my present condition." The time spent upon such homely advice yields fabulous returns in gratitude from patients and in your own peace of mind when you find that those coming for treatment of gangrene are seldom patients who were formerly under your care. I wish I could say *never* instead of *seldom*, but I cannot, because one of my own cases of 11 years' duration, Case No. 600, recently died as the result of a simple paronychia with subsequent gangrene of the hand, and another, Case No. 177, now has gangrene resulting from a hot water bag. But let us spend no more time on such sad themes but rather seek to prevent future needless deaths in this disease by considering the treatment of gangrene which is employed today.

If injuries do develop treatment should be immediate, and the patient should be considered as on the verge of death and should be placed in the most favorable situation for recovery. Over and over again, good results can be attained by careful medical treatment and years of useful life saved. It is true that occasionally diabetic gangrene develops when there has been no external trauma, but this is rare. Elevation of the foot, massage, quick douching with hot and cold water, all will promote reestablishment of circulation and yield surprisingly good results. If the arteriosclerosis is extreme or if the vessel is actually obstructed nothing can be done in the end except amputation. Here again the moderate restriction of diet instead of extremes in diet may save the patient.

Many of the needless deaths due to diabetic gangrene were formerly connected with the anesthetic employed. In such cases I am convinced that spinal anesthesia or gas oxygen anesthesia has greatly lessened mortality. Some patients may survive the use of ether and a still smaller number may survive chloroform, but these latter two methods of anesthesia are dangerous.

These two groups—coma and diabetic gangrene—are the chief causes of diabetic deaths. Pneumonia, tuberculosis, cancer, old age, all occur with diabetes as with any group of patients, and it is true resistance to disease is undoubtedly lessened in the diabetic individual, but such causes of death should not distract our attention from the main causes—coma and gangrene. On the other hand, one should not be oblivious to the effects of under-nutrition which underlie and are responsible in large degree for the non-resistance of diabetic patients in infections. Few individuals ever die from pure starvation. They succumb before this is reached, because their general





20 per cent. groups. By 1914 this had grown to include a table of carbohydrate, protein, fat and caloric values for the short list of necessary foods, and in 1917 this table was moulded by experience and the compulsion of saving time into a series of Test Diets with which to make patients sugar free. These Test Diets served their purposes so well that a year ago I began experimenting with a progression of Maintenance Diets for building up a satisfactory permanent diet for the patient. Experience shows that these scheduled diets are easily used and modified by practitioners and patients who have not the time to work out the principles as formerly stated. They systematize treatment, shorten hospital stay, by the greater ease of education, and facilitate after-care.

Since there is quite general agreement on the allowance of protein being maintained at about 1.0 gram per kilogram body weight, decreasing to a lower figure in very severe cases and to a higher in children, the diets have been arranged with this in view. On the other hand the friendly rivalry of the hour runs over the low carbohydrate high fat ratio versus the high carbohydrate normal fat attempt. The latter policy being my own preference underlies the following system. Thus the prime facts, the foods and their values, the test diets with which to make the patient sugar free, and the maintenance diets, by which he can be permanently nourished, are easily printed on one card. During this last year this diet scheme has been deliberately submitted to tests in preparation for this lecture, and though it is by no means ideal it has proven so much more satisfactory to doctors, nurses, and patients, than methods which the writer has formerly employed that he ventures to recommend it for wider application, criticism and eventual improvement.

The principles adopted in compiling these diets have been to increase the carbohydrate approximately 10 grams from day to day, and at the same time to introduce a moderate amount of protein and fat in such proportions that it would be unlikely that the protein would exceed 1 gram per kilogram body weight of the patient, or that the fat would be disproportionately high. Thus, if one examines the Maintenance Diets for the twelve days, it will be noted that a patient weighing 60 kilograms would be receiving at the end of twelve days 30 calories per kilogram body weight. This would be divided up between carbohydrate 155 grams, or approximately half of the normal amount, which such an individual would take in health, about the same amount of protein as in health, namely 1.25 grams per kilogram body weight, and the balance of the diet in fat, representing about twice the ordinary amount of fat which such an individual would eat. The

typical patient coming for treatment would be placed upon Test Diet 1 and thereafter progress daily through the various Test Diets. Becoming sugar free upon Test Diet 5 he would begin with Maintenance Diet C1PF1 and increase steadily from day to day until the end of the series. Repeatedly this schedule has been followed and patients, whose tolerance for carbohydrate was supposed to be low, finally have been able to receive the full Maintenance Diet of the twelfth day. More often it has been necessary to individualize treatment. Patients who have had the disease for some time but have relapsed and show sugar would be placed upon a Test Diet, approximately corresponding with the carbohydrate which they reported they had been taking, or when this was unknown upon that Test Diet which corresponded in quantity of carbohydrate to the quantity of sugar which was being excreted in the urine during the twenty-four hours.

Frequently patients would become sugar free, or almost sugar free, on the second, third, or fourth Test Diet. When this was recognized such patients were promptly transferred to Maintenance Diets containing carbohydrate of approximately equivalent proportions, thus saving several days' treatment. More and more it has been found possible to use this method. On the other hand, the exact method as prescribed has so often led to a carbohydrate tolerance far higher than at first was conceived possible that there is always hesitation in departing from the routine of the card. Very few patients following this system of treatment require fasting to become sugar free.

Contra-indications arise with any plan of routine treatment and they occur with cases such as described on the writer's earlier card: severe, long-standing, complicated, obese, and elderly cases, as well as all cases with acidosis. Such individuals should be carefully observed and it may be desirable to proceed no farther than Test Diet 4, and then follow it with Maintenance Diet C3PF3, postponing making the patient sugar free for a few days longer. Account is also taken of these dangers in the plan of treatment advocated by Newburgh and Marsh. They have adopted as a routine for their patients a diet with a caloric value which does not fall below 1000 calories or about half a normal ration. The continued use of a low caloric diet will lead to most any patient becoming eventually sugar free. This principle of dependence upon partial caloric restriction has worked especially well in elderly cases which have come for treatment of diabetic gangrene. With these no attempt has been made at desugarization within a short period, but reliance has been placed upon partial nutrition to accomplish this during the few weeks' hospital stay.

The reasons for the treatment prescribed should be made real to the patient from the very start. It should be visibly demonstrated to him that the quantity of sugar which he is excreting amounts to a pound, more or less, in twenty-four hours, and as his diet is curtailed he should be shown that the sugar in the urine decreases. The quantity of sugar and starch in the common foods which he is to eat or not eat, but will see constantly before him, should be impressed upon him. He should learn that a large apple weighs 300 grams (10 ounces) and contains 3 tablespoonfuls of sugar, that a moderate sized apple contains 2 tablespoonfuls, and that a small apple weighs about 100 grams, almost a quarter of a pound, and contains 1 tablespoonful of sugar, the same amount as in a medium-sized orange. It is worth while to set forth the dangers of bread by comparing the 18 grams carbohydrate in 30 grams (1 ounce), with the same amount which is contained in 540 grams (18 ounces) of 5 per cent. vegetables, or even 900 grams of lettuce. It takes but a moment to point out that in a

Uneda biscuit are 5 grams of carbohydrate, in a Triscuit 8 grams, and in one Shredded Wheat biscuit 23 grams, that an egg has 6 grams of protein and 6 grams of fat. The patient may not learn all the food values, but he must be taught what kind of food he is to eat, what it weighs, or its size. He must be given specific directions. If he does not know but one 5 per cent. vegetable, let him live upon that until he learns another. The following Tables 7, 8, 9, 10 and 11, illustrate the practical application of the treatment described to specific cases.

Before leaving the subject of these Tests and Maintenance Diets may I report one ambulatory case. Case No. 2603, a man, 52 years of age, came to the office upon April 21, 1922, showing 7.0 per cent. of sugar in the urine. He did not wish to go to the hospital and was given the Test and Maintenance Diet card and told to begin with Test Diet 1, and progress daily until he became sugar free, or reached Test Diet 5. On April 26, after a day upon Test Diet 5, the urine contained 0.2 per cent. of sugar and he was transferred to Maintenance

Table No. 7 Chart Illustrating Simplicity of Treatment of Diabetes with Test and Maintenance Diets

Case No. 2343 Age at Onset -- August, 1921 -- 20.10 years

Date	Sugar		Diet Ordered Test or Maintenance	Diet Calculated			Weight kilograms not
	Urine %	Blood %		Carb.	Prot.	Fat	
1921							
Sept.							
13		0.45 <sup>1</sup>					64
14	9.5			65	27	0	368
15	4.8		T. D. 1	189	89	15	1247
16	1.0		T. D. 2	102	56	0	640
17	0.5		T. D. 3	64	33	0	396
18	0.1		T. D. 4	36	27	0	252
19	0	0.07	T. D. 5	15	5	0	80
20	0		C <sub>2</sub> PF <sub>2</sub>	20	13	18	302
21	0		C <sub>3</sub> PF <sub>3</sub>	32	24	24	440
22	0		C <sub>5</sub> PF <sub>5</sub>	52	32	53	813
23	0	0.08	C <sub>7</sub> PF <sub>7</sub>	73	52	68	1112
24	0		C <sub>8</sub> PF <sub>8</sub>	85	63	87	1376
25	0	0.10	C <sub>9</sub> PF <sub>9</sub>	98	66	93	1493
26	0		C <sub>10</sub> PF <sub>9</sub>	107	65	87	1471
27	0		C <sub>11</sub> PF <sub>9</sub>	133	71	53	1653
28	0		C <sub>12</sub> PF <sub>9</sub>	149	72	53	1701
1922							
Mar.							
22	0	0.13	C <sub>12</sub> PF <sub>12</sub>	155	80	99	1831
May							
3	0	0.14	C <sub>12</sub> PF <sub>12</sub>	155	80	99	1831
							62.6

<sup>1</sup> Tables after a meal

The only orders written for the patient were those between the lines of the above table

Table No. 8 One Day of Fasting Required to Make Patient Sugar-Free

Case No. 2504 Age at Onset -- January, 1922 -- 16.9 years

Date	Di-acetic Acid	Sugar Urine %	Blood Pct. %	Diet ordered Test or Maintenance	Carb.	Prot.	Fat	Diet Calculated	Weight kilograms net
1922 April									
22	--	6.0			67	27	0	376	54.4
23	-	7.5							
24	0	7.5	0.26 <sup>1</sup>	T. D. 1	180	80	15	124	
25	0	4.3		T. D. 2	102	86	0	660	
26	0	2.5		T. D. 3	64	33	0	368	
27	0	1.9		T. D. 4	36	27	0	252	
28	0	0.6		T. D. 5	15	6	0	80	
29	0	0		Fasting	0	0	0	0	
30	0	0	0.13	C <sub>1</sub> PF <sub>1</sub>	10	11	6	158	
May									
1	0	0		C <sub>2</sub> PF <sub>2</sub>	22	18	18	322	
2	0	0		C <sub>3</sub> PF <sub>3</sub>	32	29	29	586	
3	0	0		C <sub>4</sub> PF <sub>4</sub>	42	29	52	762	
4	0	0	0.17	C <sub>5</sub> PF <sub>5</sub>	53	41	64	952	
5	0	0		C <sub>6</sub> PF <sub>6</sub>	53	49	99	1029	
6-9	0	0	0.16	C <sub>6</sub> PF <sub>6</sub>	55	57	84	1198	
9-15	0	0	0.12	C <sub>6</sub> PF <sub>6</sub>	53	57	86	1214	54.1

<sup>1</sup> Taken fasting

Loss disappearance of acidosis as well as sugar from the urine and the decrease of sugar and fat in the blood. The patient originally showed marked acidosis. Will he ever regain a substantial tolerance for carbohydrate?

Table No. 9 A Fat Woman Becomes Sugar Free and 10 Months After Onset Has a Tolerance For 150 Grams Carbohydrate and Blood Sugar Is Almost Normal

Case No. 2586 Age at Onset -- July, 1921 -- 45.2 years. Weight 5-2 net

Date	Sugar Urine %	Blood Pct. %	Diet Calculated Test or Maintenance	Carb.	Prot.	Fat	Cal.	Weight kilograms net
1921								
Oct. 7	9.1	0.37 <sup>1</sup>						
9-10	3.6		T. D. 2 <sup>2</sup>	115	44	12	744	
10-11	1.3		T. D. 3 <sup>2</sup>	49	54	0	382	
11-12	0.2		T. D. 4 <sup>2</sup>	31	25	0	224	71.6
12-13	0		T. D. 5 <sup>2</sup>	16	27	0	252	
13-14	0	0.16	C <sub>2</sub> PF <sub>2</sub>	22	13	26	302	
14-15	0		C <sub>4</sub> PF <sub>4</sub>	42	29	39	635	
15-16	0		C <sub>5</sub> PF <sub>5</sub>	53	43	58	1009	
16-17	0		C <sub>6</sub> PF <sub>6</sub>	53	57	87	1351	
17-18	0		C <sub>6</sub> PF <sub>6</sub>	55	51	57	1407	
18-19	0		C <sub>10</sub> PF <sub>6</sub>	106	53	79	1387	
21-22	0	0.14	C <sub>12</sub> PF <sub>6</sub>	124	56	78	1412	
1922								
May 8	0	0.12	C <sub>12</sub> PF <sub>12</sub>	155	40	94	1786	68

<sup>1</sup> Taken 8 hours after a meal<sup>2</sup> Also only part of it

Diet C2PF2, and by May 25 he was taking cent. This patient depended upon the equivalents of food shown at the bottom of the card instead of using scales. I believe he would

Table No. 10. General No. 2456 Age at Onset -- May, 1921 -- 17.9 years

Date	Sugar in Urine %	Diet Test or Maintenance	Weight kilograms net
1921			50.4
Mar. 28	0.0 0.31 <sup>1</sup>		
30	2.0	T. D. 1 <sup>2</sup>	
30	2.0	T. D. 2	
June 1	1.7	T. D. 3	
6	0.3	T. D. 4	
8	0	T. D. 4	
4	0	C <sub>5</sub> P <sub>75</sub>	
6	0	C <sub>4</sub> P <sub>74</sub>	
6	0	C <sub>6</sub> P <sub>76</sub>	
7	0	C <sub>7</sub> P <sub>77</sub>	
8	0	C <sub>8</sub> P <sub>78</sub>	
9	0	C <sub>9</sub> P <sub>79</sub>	
10	0	C <sub>10</sub> P <sub>80</sub>	
11	0	C 135-P 60-7 63	
12	0		
13	0		
14	0		
15	0		
16	0		
17	0		
18	0		
19	0		
20	0		
21	0		
22	0		
23	0		
24	0		
25	0		
26	0		
27	0		
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30	0		
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36	0		
37	0		
38	0		
39	0		
40	0		
41	0		
42	0		
43	0		
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45	0		
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78	0		
79	0		
80	0		
81	0		
82	0		
83	0		
84	0		
85	0		
86	0		
87	0		
88	0		
89	0		
90	0		
91	0		
92	0		
93	0		
94	0		
95	0		
96	0		
97	0		
98	0		
99	0		
100	0		

In this case the carbohydrate was increased and protein was decreased. The patient had an increase of the total body weight (1) and the sugar rose and tolerance fell.

1. 4:00 P. M.  
2. Test Males Only Men

Table No. 1505 Age at Onset -- May, 1917 -- 10 years

Date	Days on given diet	Urine Diabetic acid	Amo- no- nit	C	F	Cal.	Weight per cent	Blood sugar mg. per 100
1917								
Jan. 2	1	---	60	2.1	51	10	2	102
3	2	---	63	2.1	51	10	2	102
4	3	---	63	2.1	51	10	2	102
5	4	---	63	2.1	51	10	2	102
6	5	---	63	2.1	51	10	2	102
7	6	---	63	2.1	51	10	2	102
8	7	---	63	2.1	51	10	2	102
9	8	---	63	2.1	51	10	2	102
10	9	---	63	2.1	51	10	2	102
11	10	---	63	2.1	51	10	2	102
12	11	---	63	2.1	51	10	2	102
13	12	---	63	2.1	51	10	2	102
14	13	---	63	2.1	51	10	2	102
15	14	---	63	2.1	51	10	2	102
16	15	---	63	2.1	51	10	2	102
17	16	---	63	2.1	51	10	2	102
18	17	---	63	2.1	51	10	2	102
19	18	---	63	2.1	51	10	2	102
20	19	---	63	2.1	51	10	2	102
21	20	---	63	2.1	51	10	2	102
22	21	---	63	2.1	51	10	2	102
23	22	---	63	2.1	51	10	2	102
24	23	---	63	2.1	51	10	2	102
25	24	---	63	2.1	51	10	2	102
26	25	---	63	2.1	51	10	2	102
27	26	---	63	2.1	51	10	2	102
28	27	---	63	2.1	51	10	2	102
29	28	---	63	2.1	51	10	2	102
30	29	---	63	2.1	51	10	2	102
31	30	---	63	2.1	51	10	2	102
32	31	---	63	2.1	51	10	2	102
33	32	---	63	2.1	51	10	2	102
34	33	---	63	2.1	51	10	2	102
35	34	---	63	2.1	51	10	2	102
36	35	---	63	2.1	51	10	2	102
37	36	---	63	2.1	51	10	2	102
38	37	---	63	2.1	51	10	2	102
39	38	---	63	2.1	51	10	2	102
40	39	---	63	2.1	51	10	2	102
41	40	---	63	2.1	51	10	2	102
42	41	---	63	2.1	51	10	2	102
43	42	---	63	2.1	51	10	2	102
44	43	---	63	2.1	51	10	2	102
45	44	---	63	2.1	51	10	2	102
46	45	---	63	2.1	51	10	2	102
47	46	---	63	2.1	51	10	2	102
48	47	---	63	2.1	51	10	2	102
49	48	---	63	2.1	51	10	2	102
50	49	---	63	2.1	51	10	2	102
51	50	---	63	2.1	51	10	2	102
52	51	---	63	2.1	51	10	2	102
53	52	---	63	2.1	51	10	2	102
54	53	---	63	2.1	51	10	2	102
55	54	---	63	2.1	51	10	2	102
56	55	---	63	2.1	51	10	2	102
57	56	---	63	2.1	51	10	2	102
58	57	---	63	2.1	51	10	2	102
59	58	---	63	2.1	51	10	2	102
60	59	---	63	2.1	51	10	2	102
61	60	---	63	2.1	51	10	2	102
62	61	---	63	2.1	51	10	2	102
63	62	---	63	2.1	51	10	2	102
64	63	---	63	2.1	51	10	2	102
65	64	---	63	2.1	51	10	2	102
66	65	---	63	2.1	51	10	2	102
67	66	---	63	2.1	51	10	2	102
68	67	---	63	2.1	51	10	2	102
69	68	---	63	2.1	51	10	2	102
70	69	---	63	2.1	51	10	2	102
71	70	---	63	2.1	51	10	2	102
72	71	---	63	2.1	51	10	2	102
73	72	---	63	2.1	51	10	2	102
74	73	---	63	2.1	51	10	2	102
75	74	---	63	2.1	51	10	2	102
76	75	---	63	2.1	51	10	2	102
77	76	---	63	2.1	51	10	2	102
78	77	---	63	2.1	51	10	2	102
79	78	---	63	2.1	51	10	2	102
80	79	---	63	2.1	51	10	2	102
81	80	---	63	2.1	51	10	2	102
82	81	---	63	2.1	51	10	2	102
83	82	---	63	2.1	51	10	2	102
84	83	---	63	2.1	51	10	2	102
85	84	---	63	2.1	51	10	2	102
86	85	---	63	2.1	51	10	2	102
87	86	---	63	2.1	51	10	2	102
88	87	---	63	2.1	51	10	2	102
89	88	---	63	2.1	51	10	2	102
90	89	---	63	2.1	51	10	2	102
91	90	---	63	2.1	51	10	2	102
92	91	---	63	2.1	51	10	2	102
93	92	---	63	2.1	51	10	2	102
94	93	---	63	2.1	51	10	2	102
95	94	---	63	2.1	51	10	2	102
96	95	---	63	2.1	51	10	2	102
97	96	---	63	2.1	51	10	2	102
98	97	---	63	2.1	51	10	2	102
99	98	---	63	2.1	51	10	2	102
100	99	---	63	2.1	51	10	2	102

1. Per cent

A boy with diabetes of 5 years' duration can become sugar free, have a normal blood sugar and take 36 calories per kilogram, as G. P. 16 (2/5 gram per liter.), P. 87. The blood sugar rises and glycosuria appears with increase of G. 4 gram and P. 3 grams. This is due to a low-carbohydrate diet.



have done better at the hospital, but he demonstrated how easy it is to carry out treatment by occasional calls at a doctor's office.

#### ACIDOSIS.

As we are told to avoid the appearance of evil, it is the A B C of diabetic treatment to avoid even the appearance of acidosis. In any discussion of the routine treatment of diabetes it is necessary to include a consideration of the treatment of acidosis and deaths resulting from diabetic coma. It is generally recognized that when a certain amount of carbohydrate is oxidized in the body acidosis does not exist, and Shaffer has done us all a service by analyzing the literature and presenting a formula which shows just how much carbohydrate must be oxidized to prevent acid poisoning. His formula appears to be the most reliable guide which we have today. It is founded on the principle that one should consider the total metabolic needs of the body whether supplied by food or body tissue and is based on the conception that 2 molecules of fatty acid can be oxidized by 1 molecule of glucose. To the basal metabolism of the patient Shaffer proposed adding 30 per cent. for activity, but for the quiet diabetics it is probably better to add 20 per cent. From this total he subtracts the equivalent of 100 times the grams of nitrogen excreted in the urine and divides the remainder arbitrarily by 50 to get the theoretically lowest quantity of carbohydrate which can prevent acidosis for such an individual. This figure represents the carbohydrate required for the day. Since it must be simultaneously burned with the protein and fat and thus be continuously consumed during each hour of the twenty-four, he considers it safe to double this quantity. Shaffer's formula represents a great advance in treatment, because it makes precise the quantity of carbohydrate which must be oxidized and allows the administration of larger quantities of fat with safety than hitherto thought admissible. In the future, therefore, one can prescribe carbohydrate, protein, and fat to diabetic patients in such proportions as to yield the greatest amount of energy and yet avoid acidosis, provided there is still some tolerance for carbohydrate left; and this is apparently always the case.

For practical purposes the writer has for several years sought to overcome acidosis by the promotion of oxidization of carbohydrate, and the limitation of oxidization of fat, and has strenuously stood out against the necessity of the use of alkalis. Shaffer's formula shows that the alkalis are needless and that emphasis should be placed upon the regulation of the carbohydrate-fat ratio based upon the actual metabolism.

If, despite our efforts, acidosis threatens, the following routine treatment is recommended: (1) Reduce the total metabolism by placing the patient in bed and providing a nurse, to save all needless exertion; (2) Administer abundant liquids—240 c.c.—each hour in order to promote the excretion of acid bodies; (3) Promote evacuation of the bowels not only to favor digestion but in order to enable, if desired, enemata of salt solution or water to be given in case water is not retained by the mouth; (4) Wash out the stomach in the first stages of treatment, because, frequently, coarse food is retained, which leads to vomiting, and loss of valuable hours; and (5) Administer moderate quantities of carbohydrate,—either levulose, which is readily obtained in the form of orange juice, or if this is disliked or for any reason contraindicated, oatmeal gruels and skimmed milk. I have avoided fat largely because it is more apt to upset the digestion of a patient upon the verge of coma, and second because from fat the acid bodies which lead to coma are formed. Recently, evidence has been submitted that body fat will be consumed if extraneous fat is not given, but at present it appears safe in the presence of threatening acidosis to cling to the above-mentioned plan of treatment, and if the body is to burn fat to let it select its own dose. Confidence in this method has grown because there has been less than one per cent. of fatalities from coma in more than 600 cases treated in hospitals since April 1, 1919, and two of these deaths occurred within 36 hours of admission. Confidence also has been engendered in it because of a series of 15 cases who have recovered without alkalis from acidosis so severe that the  $\text{CO}_2$  in the alveolar air was as low as 18 mm. tension Hg.

None of the coma deaths in the hospital took place with patients who were placed upon Test Diet 1 and systematically advanced according to the general plan of treatment outlined above. Such a death, however, has been reported to the writer in an elderly patient who had arteriosclerosis and a bad heart; this warrants iteration of the phrase upon which I have so often insisted regarding the conservative treatment of severe, long standing, complicated, obese, or elderly cases, as well as those with acidosis; in these types one should depend upon much more gradual undernutrition and thus escape Test Diet 5, or even 4, and after a day or two upon Test Diet 3 transfer to Maintenance Diets of the third, fourth or fifth day.

#### TREATMENT WITH LOW CARBOHYDRATE AND LOW PROTEIN AND HIGH FAT DIETS. (NEWBURGH AND MARSH.)

Thus far the routine treatment which the writer uses has been described. It is based upon undernutrition as introduced by F. M.

Allen in 1914, and though undernutrition has often been carried to extremes it is today the fundamental basis upon which all treatment rests. The modifications of it already described are simply what the writer has found to be desirable with his own cases. In the last two years another plan of treatment has been proposed by Dr. Newburgh and Dr. Marsh of Ann Arbor. Their method also rests upon the principle of undernutrition in that the patients at the beginning of treatment are given about half the required number of calories, but to this principle they add that of limiting the protein, at first to an extremely small figure,—namely 10 grams,—and even later holding it nearly at the minimum requirement of 0.66 gram per kilogram body weight. The balance of the diet is made up of carbohydrate 14 grams, and fat 90 grams, thus bringing the total diet up to nearly 1000 calories. They describe their method of treatment as follows: "When a patient enters the clinic, he is placed on a diet containing from 900 to 1000 calories, of which about 90 gm. is fat, 10 gm. is protein, and 14 gm. is carbohydrate. After the patient has been sugar free for one or two weeks, his diet is increased to about 1,400 calories, of which 140 gm. is fat, 28 gm. is protein, and from 15 to 20 gm. is carbohydrate. In the case of small individuals this diet is sufficient for prolonged use, and some of them are discharged with instructions to continue it. For larger persons, after another period of trial, a second increase is made, reaching 1,800 calories, containing 170 gm. of fat, from 30 to 40 gm. of protein, and from 25 to 30 gm. carbohydrate. Further additions up to 2,570 calories may be made to suit individual cases."

"In order to prove that our procedure is an improvement over the usual method, we must show, (1) that glycosuria is avoided in severe diabetes; (2) that this diet does not precipitate acidosis; (3) that nitrogen equilibrium is maintained; and (4) that the patients are able to lead at least a moderately active, comfortable life."

Credit should be given to Dr. Newburgh and Dr. Marsh for their courage in prescribing so much fat for diabetics. Despite the literature on high fat diets there has been of recent years a distinct fear of fat, fostered, it is true, by the writer, which now the Woodyatt and Shaffer formulas to a considerable extent abate. The secret of success in the Newburgh and Marsh plan lies in the limitation of the amount of fat combined with a low protein allowance, and these are the reasons why acidosis does not develop. With these diets they have made the urines of patients sugar free, reduced blood sugar to normal, and, what appears hard to understand, have lowered the fat in the blood. Their cases, however, are not yet of sufficient

duration to show that these diets are satisfactory for diabetic patients for long periods or are the best diets for early cases. That their system has produced some remarkable results Table 11 above shows. With this 15-year-old boy, whose diabetes was of 5 years' duration, the Newburgh and Marsh plan of treatment succeeded after other plans had failed.

Newburgh and Marsh have emphasized the necessity of the diabetic patient receiving sufficient calories. They have done great service in this regard. Confirmation of their tenet that the effect of food, whether derived from external sources or from the sacrifice of body tissue, is much the same has been recently furnished by the Russell Sage Clinic, where Du Bois and Richardson have gone so far as to demonstrate that the metabolism remains unaltered when corresponding quantities of carbohydrate, protein, and fat, are burned, whether derived from food or from body tissue. It is, however, again emphasized that the diets proposed by Newburgh and Marsh are limited diets. Fat is not given in an unrestricted manner, protein is most radically curtailed, and so is carbohydrate. The object of the diet is to keep the patient sugar free and no attempt is made to add to the weight. These features of the diet must be repeated over and over because thoughtless practitioners and greedy patients have caught the words "high fat" and have prescribed or used fat in harmful quantities. It requires a great deal of intelligence to live on a low carbohydrate, low protein, and high fat diet. The dangers of breaking over such a diet by increasing fat are far greater than the dangers of breaking over a diet by increasing carbohydrate. The patient who breaks over only in carbohydrate pays an immediate penalty and is warned by increased urination; the patient who breaks over only in fat is not warned and dies.

The statistics of the Ann Arbor, and the writer's clinics have been compared in many ways. The newer methods yield no better results so far than the old. I believe, however, that the mutual interchange of ideas between the two clinics, and the adoption of some of the features employed in each will distinctly raise the duration of life of diabetics who come for treatment in the future.

#### HIGH CARBOHYDRATE DIET.

I cannot escape from the impressions: (1) that in those countries where the diet consists largely of carbohydrate, the diabetes is mild; (2) that the diets of those diabetics who live longest, whether they show sugar or not, are those whose carbohydrate has never been long reduced to a very low quantity; (3) that as yet few cases have been published who have lived outside of institutions upon very low carbohy-

drate and high fat diets, and attained an average duration of their diabetes, equivalent to those recorded for my own, 597 fatal cases, since June, 1914, appearing in Table 1. Of all my cases I recall but one, Case No. 632. He has lived for the last six years on approximately carbohydrate 28 grams, protein 79 grams, fat 133 grams, alcohol 15 grams. He developed diabetes at the age of 33 years, in 1913. I wonder if he would be better off today if the protein these six years had been lower; (4) that, given a diabetic in the last stage of inanition, he may gain a considerable lease of life when carbohydrate and protein are given freely; but this, however, is soon shortened by coma if much fat is added too; (5) that if the liver can be made to harbor any carbohydrate it is a protective phenomenon (witness the giving of carbohydrate freely to children prior to tonsillectomies and the resulting avoidance of acidosis thereby); (6) that upon analysis of cases of coma it will be found that usually preceding its onset carbohydrate has been lowered and the fat metabolized has been increased, whether from exogenous or endogenous sources; and (7) finally, that as the work done by Benedict, and the writer, at the Nutrition Laboratory has shown, there is no diabetic so severe as to have completely lost the power of responding to carbohydrate by a failure to raise the respiratory quotient as a result of its administration.

My attention to a high carbohydrate and low fat diet has been especially drawn by a little boy, Case No. 2007, George B., an only child, who eighteen months after onset continues to keep sugar free on a diet of carbohydrate 165 grams, protein 70 grams, fat 44 grams. The diagnosis was made by Dr. John Lovett Morse in the course of a routine examination on December 1, 1920, at 5.8 years of age, a few days after the beginning of symptoms, when the urine showed a specific gravity of 1.035. It was 1.028 on the following day. The percentage of sugar on December 3 was 4.4. Ten days after the onset of symptoms he excreted but 3 grams of sugar, although his diet consisted of Test Diet 2, carbohydrate 102 grams, protein 58 grams, fat none, calories 640, and he was sugar free the next day on Test Diet 3—carbohydrate 64 grams, protein 33 grams, fat none. From that time on his carbohydrate has been gradually increased until he is now taking carbohydrate 165 grams. The protein has been raised from 33 grams to 70 grams, i.e., 3.3 grams per kilogram body weight, but the fat has been constantly kept low, never having risen above 44 grams. This little boy, George B., has been sugar free, except on two occasions, November, 1921, when he had an infection with a temperature of 102 degrees, for three days, and showed a trace of sugar, and again in February, 1922, when he had a

cold. He has gained three to four pounds in 17 months, and an inch and one-quarter in height. The diet has never been broken. The urine is examined daily and often several times daily. No examination of the blood was made until the completion of this paper, when the importance of the case made this seem obligatory. On June 7, 1922, two hours after a meal, the blood sugar was found to be 0.09 per cent.

The example of this case suggested similar treatment for other cases, and in Tables 12, 13, 14 and 15 the course of some of these is summarized. None of these other cases have done quite as well. Case No. 2140, aged 20.8 years, at onset, who originally showed 7.0 per cent. sugar, with acidosis, and later acquired a tolerance of carbohydrate 186 grams, protein 89 grams, fat 75 grams, fell out of the race when he ate nine doughnuts one night; Case No. 2052 thoughtlessly broke his diet by the addition of cream, and thus jeopardized his future; Case No. 2095 suffered from a tonsillitis. The little boy, George B., however, has never broken his diet, and not one of my patients has had such close care. The future of this child, therefore, should disclose the merits of this form of treatment. It is, however, fully realized that faithful supervision of a diabetic case, provided the diet is not distinctly bad, i.e., excessive, is so great a factor in treatment that it largely overcomes many minor dietetic faults. Whether the little boy, Case No. 2007, George B., is so very unusual, time will tell.

Strangely enough, by one of those coincidences so common in medicine, a case similar in many respects—Jack R., Case No. 2661, who has been under the care of another physician from the beginning—I have just had the opportunity to observe for a few days. This little boy is also an only child, his diabetes was also diagnosed promptly after onset of symptoms, namely, in September, 1921, at the age of 5.1 years. The first specimen of urine showed 8.0 per cent. sugar in October, 1921. At present, May 26, 1922, nine months since the onset of his diabetes, his diet is: Carbohydrate, 36 grams; protein, 42 grams; fat, 114 grams—making the calories 1338, or exactly identical with those of George B. His fasting blood sugar was 0.09 per cent. on May 26, and on May 29, 0.07 per cent., and the blood fat 0.71 per cent. His weight at onset was 17.1 kilograms and today is 16.9 kilograms. The urine contains no sugar, but shows a positive test for acetone and for diacetic acid. The average of the 24-hourly analyses of ammonia for five days is 0.53 grams, and of nitrogen, 7.8 grams. Since each child will be guarded by the parents with equally scrupulous care their careers will be watched with aggressive vigilance, since I know of no two cases who are as likely to afford crucial evi-

TABLE No. 12.—The Use of a High Carbohydrate Low Fat Diet in Youthful Diabetics.

Case No. 2007, Geo. B. Age at Onset — November, 1910 — 5.8 years. After 17 Months He Tolerates Carb. 140 grs., Prot 70 grs., Fat 44 grs.

Date	Sugar Urine g	Carb.	Prot.	Fat	Cal.	Weight kilograms net
1910						
Dec. 1	1					
" 2	2					
" 3	6.4 <sup>3</sup>					21
" 4-7	0.5					
" 8-7	0.3	132	58	0	940	
" 8	0	64	33	0	388	
" 13-14	0	80	40	12	868	
" 14-15	0	90	45	15	979	
" 16-16	0	100	51	20	764	
" 19-20	0	110	52	20	928	
1921						
Jan. 8-9	0					
Feb. 23-24	0					
Apr. 7-8	0	140	60	40	1160	
July 26-27	0	137	68	42	1268	
Aug. 25-26	0	155	70	44	1296	
1922						
Apr. 29	0	165	70	44	1336	
June 7	0	168	70	44	1356	25

<sup>1</sup> Spec. Grav. 1.036 <sup>2</sup> Spec. Grav. 1.028 <sup>3</sup> Vol. 1170, Spec. Grav. 1.051

<sup>4</sup> Blood Sugar 0.09 per cent., two hours after noon meal.

TABLE No. 13.—High Carbohydrate, Low Fat Diet.

Case No. 2009 Age at Onset — December, 1920 — 9.7 years

Date	Sugar Urine g	Blood g	Carb.	Prot.	Fat	Cal.	Weight kilograms net
1921							
Jan. 21	6.2						
" 22	6.2						
" 25	0.5						
" 26	trace		64	28	0	398	
" 27	sl. tr.		64	33	0	368	
" 28	0		58	27	0	292	
" 29	0		46	38	6	364	
" 30	0		88	41	6	450	
" 31	0		70	42	18	683	
Feb. 2-4	0		70	44	21	688	
" 11-12	0		98	49	28	910	
June 16	0 <sup>1</sup>	0.02 <sup>2</sup>	100	51	28	829 <sup>3</sup>	26

<sup>1</sup> Reported to have been constantly sugar free

<sup>2</sup> Specimen in my office five hours after meal

<sup>3</sup> Diet repeated unchanged. I fear it was later given up, because repeated urines have failed to elicit reaction

TABLE NO. 14.—High Carbohydrate Diet.

Case No. 7052 Age at Onset -- November, 1920 -- 17.5 years

Date	Sugar		Diet in Grams				Weight kilograms net
	Urine %	Blood %	Carb.	Prot.	Fat	Cal.	
1920							
Dec. 7		0.23					
1921							
Jan. 6	0	0.09					
24-25	0	0.10	87	54	35	799	53
31-Feb. 1	0	0.08	121	65	46	1176	
Feb. 12-13	0	0.09	200	71	67	1662	54
May			170	75	80	1520	
June		0.10					
Sept.		0.12	142½	57½	70½	1086½	57
Nov. 5-6	0	0.09	138	69	71	1467	56
1922							
Apr.		0.17					

TABLE NO. 15.—High Carbohydrate Diet.

Case No. 2095 Age at Onset -- November, 1920 -- 27.3 years

Date	Sugar		Diet in Grams				Weight kilograms net
	Urine %	Blood %	Carb.	Prot.	Fat	Cal.	
1921							
Feb. 21	0.3						
22	9.0						
23	3.7	0.20	95	57	0	624	50
24	1.4		64	33	0	388	
25	0.2		38	27	0	252	
26	0		16	5	4	114	
28-Mar. 1	0	0.06	41	33	9	457	
Mar. 6-7	0	0.06	131	67	14	918	
15-16	0	0.06	205	74	52	1184	59
1922							
Feb. 7	0	0.11	157	74	55	1469	60
May 19	0	0.11	160	60	69	1412	57

dence as regards the optimal carbohydrate-fat ratio. Which child is on the better diet? I confess to the preference for that diet which most closely approximates the normal. On the other hand, I do not feel justified in advising a reversal of the diet of Jack because of the presence of a normal blood sugar and a normal blood fat. It has been my experience

also that such modifications made at such a late date are disastrous.

It is only within this decade that diets generally have been accurately controlled for months and years and the quantities of carbohydrate, protein and fat recorded, and only within the last eight years that the total quantity of food has been at all closely limited. In



TABLE No. 16.—A Comparison of the Diets of Two Diabetic Children.

Case No.	Age	Onset	Present		Urine	Diet			Weight	
		Date	Condition	Sugar	O.	P.	F.	Cal.	Lbs.	
			Date, 1922							
2007	5 yrs. 8 mos.	Nov. 1920	June	0	150	70	44	1276	49½	
2661	5 yrs. 1 mo.	Sept. 1921	May	0	33	50	52	796	39¼	

Bind

TABLE No. 16.—A Comparison of the Diets of Two Diabetic Children.

Case No.	Age	Onset	Present	Urine	Diet			Weight	
		Date	Condition	Sugar	C.	P.	F.	Cal.	Lbs.
		Date, 1922							
2007	5 yrs. 8 mos.	Nov., 1920	June	0	165	70	44	1336	49½
2661	5 yrs. 1 mo.	Sept., 1921	May	0	36	42	114	1338	39½

At the request of Dr. Elliott P. Joslin, author of the paper entitled "The Treatment of Diabetes Mellitus," this corrected Table No. 16 is enclosed. Please paste this over Table No. 16 as it appears in Volume 186, No. 25, page 847, issue of June 22, 1922.

#### PROGNOSIS IN DIABETIC CHILDREN.\*

Tender-hearted parents sometimes ask, and sympathetic friends nearly always ask: "Since diabetes is always fatal in children, why prolong the agony? Why not let the poor child eat and be happy while life lasts?" The answer may be made, and, indeed, in all conscience must be made, forcefully.

1. In the dark hour that no family escapes, in that hour when one of the circle is stricken with some accident or infection that threatens life or reason, hope often falls to nearly nil. Yet often the surgeon saves the dangling life, and sometimes the doctor does, too. Who that has seen a shattered soldier or a child in meningitic opisthotonos has not thought, "What is the use? Rather anesthesia and euthanasia." But this cannot be. Courage has saved such lives, not once but many times. Just so courage has lengthened the lives of many diabetic children, and no man knows but that the cure may be at hand within the year—even the month.

\*This section was contributed to my Shattuck Lecture by Horace Gray, to whose sympathetic care of many of my diabetic children their parents testify.

Forgotten. Only an only child, is one life at the mother that of killing hope, belief is true: "I ask you, with, to herself she wakes each in her child's ain death? Is if only to save

that this child up. As I just to think a cure from that, even he have made average twice goodly number

et a lot of fun will maintain more cheerful intellectual, so-ermore, many

such restricted children not only get but give pleasure and example. Some, even among diabetic children, live *exceptionally* happy lives for years; the following case is illustrative.

Case No. 894, Rexane, developed diabetes in her babyhood, probably about January, 1914, at one year and five months of age. The diagnosis was not made for a year later. In March, 1915, the urine contained 5.3 per cent. sugar, but when I first saw her, July 30, 1915, there was but 0.2 per cent. Under routine treatment she remained quite constantly sugar free until 1917, when in July the sugar in the urine amounted to 4.0 per cent. She again became sugar free, but has been so only intermittently since. Upon May 24, 1921, the urine contained 3.0 per cent., but the morning specimen of May 26 was free from sugar. The blood sugar was 0.210 per cent. July, 1919, and in September, 1920, was 0.17 per cent. Her diet has been low. After eight years and four months of diabetes she is now 9 years and 9 months old, weighs 47.4 pounds naked, and is 45.5 inches tall, without shoes. Her diet is *approx-*

TABLE No. 14.—High Carbohydrate Diet.

Case No. 7052 Age at Onset -- November, 1920 -- 17.5 years

Date	Sugar		Diet in Grams				Weight kilograms net
	Urine %	Blood %	Carb.	Prot.	Fat	Cal.	
1920							
<i>Important</i>							
Feb. 21	8.5						
22	9.0						
23	3.7	0.20	96	87	0	674	80
24	1.4		84	33	0	568	
25	0.2		56	27	0	282	
26	0		16	8	4	124	
28-Mar. 1	0	0.06	61	33	9	457	
Mar. 6-7	0	0.06	151	67	14	918	
15-16	0	0.06	205	74	82	1384	89
1922							
Feb. 7	0	0.11	187	74	85	1609	60
May 19	0	0.11	140	80	60	1412	57

dence as regards the optimal carbohydrate-fat ratio. Which child is on the better diet? I confess to the preference for that diet which most closely approximates the normal. On the other hand, I do not feel justified in advising a reversal of the diet of Jack because of the presence of a normal blood sugar and a normal blood fat. It has been my experience

also that such modifications made at such a late date are disastrous.

It is only within this decade that diets generally have been accurately controlled for months and years and the quantities of carbohydrate, protein and fat recorded, and only within the last eight years that the total quantity of food has been at all closely limited. In

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Case No.	Age	Onset Date	Present Condition Date, 1922	Urine Sugar	O.	Diet		Cal.	Weight Lbs.
						P.	F.		
2007	5 yrs. 8 mos.	Nov. 1920	June	0	150	70	44	1276	49%
2661	5 yrs. 1 mo.	Sept. 1921	May	0	82	50	58	796	39%

consequence it is only today that we are in a position to compare the effects of various diets, only today that we can begin to discuss how, for instance, it is best to distribute a given caloric intake between the three food-stuffs. In point are the two "only" children cases described above. So far as I am aware, no data exist to prove which is the better of the diets prescribed for these two, and so one is forced to prescribe empirically.

Lest the idea be gained that one can be careless about the diet of diabetic patients, I report two cases in children in which the disease was not discovered promptly. These cases, Nos. 2560 and 2568, did not begin treatment until the disease had established itself for respectively eight months and a half and seven months. This was most unfortunate. These children demonstrate this clearly when compared with Case No. 2007 and with Case No. 2661, who are younger children, but have received the advantages of earlier treatment. Case No. 2007, diagnosed promptly and with his diabetes now almost twice the duration, is taking nearly twice as many calories as Case No. 2560.

#### PROGNOSIS IN DIABETIC CHILDREN.\*

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1. In the dark hour that no family escapes, in that hour when one of the circle is stricken with some accident or infection that threatens life or reason, hope often falls to nearly nil. Yet often the surgeon saves the dangling life, and sometimes the doctor does, too. Who that has seen a shattered soldier or a child in meningitic opisthotonos has not thought, "What is the use! Rather anesthesia and euthanasia." But this cannot be. Courage has saved such lives, not once but many times. Just so courage has lengthened the lives of many diabetic children, and no man knows but that the cure may be at hand within the year—even the month.

\*This section was contributed to my Shattuck Lecture by Horace Gray, to whose sympathetic care of many of my diabetic children their parents testify.

2. The mother must not be forgotten. Only too often the diabetic child is an only child, but though there be others this one life at stake is so intimately a part of the mother that we cannot do her the injury of killing hope, of admitting "Yes, popular belief is true: your child can never grow up." I ask you, what is that mother's life worth, to herself and her family, so long as she wakes each morning to interpret any change in her child's condition as a step toward certain death? Is not hope worth keeping alive—if only to save her nervous system?

3. Finally, it is not true that this child before us can not possibly grow up. As I just said, there is real reason today to think a cure is near at hand. But, apart from that, even the methods at present available have made many children today live on the average twice as long as ten years ago, and a goodly number for over five years.

4. Many of these children get a lot of fun out of life. Who but a moron will maintain that cripples are not often both more cheerful and braver than many of our intellectual, social, political leaders! Furthermore, many such restricted children not only get but give pleasure and example. Some, even among diabetic children, live *exceptionally* happy lives for years; the following case is illustrative.

Case No. 894, Rexane, developed diabetes in her babyhood, probably about January, 1914, at one year and five months of age. The diagnosis was not made for a year later. In March, 1915, the urine contained 5.3 per cent. sugar, but when I first saw her, July 30, 1915, there was but 0.2 per cent. Under routine treatment she remained quite constantly sugar free until 1917, when in July the sugar in the urine amounted to 4.0 per cent. She again became sugar free, but has been so only intermittently since. Upon May 24, 1921, the urine contained 3.0 per cent., but the morning specimen of May 26 was free from sugar. The blood sugar was 0.210 per cent. July, 1919, and in September, 1920, was 0.17 per cent. Her diet has been low. After eight years and four months of diabetes she is now 9 years and 9 months old, weighs 47.4 pounds naked, and is 45.5 inches tall, without shoes. Her diet is *approx-*

*mately:* Carbohydrate, 50 grams; protein, 50 grams; fat, 50 grams. In 1918 she spoke each day for a week at a Keith's theatre, selling Liberty bonds, and a year ago was kind enough to sing for the New England Pediatric Society, to show that a diabetic child was happy. This bright, attractive and plump little creature now "is looking extremely well and in high spirits," and will act this week as flower girl at her sister's wedding.

#### CLASSIFICATION OF DIABETES.

The classification of diabetes into mild, moderate and severe has been a common practice, useful in discussions and in comparisons of treatment. The diabetic with less than 10 grams tolerance for carbohydrate was long considered severe, with 10 to 50 grams tolerance moderate, and with over 50 grams mild. Today we know that such a classification is uncertain. The underfed diabetic may appear to have an abnormally high tolerance. The method is furthermore fallacious in that the glucose-forming power of protein and of the glycerin in fat is disregarded. A better classification now exists, thanks to the emphasis put upon the question by Woodyatt, and is dependent upon the *total glucose* (G) derived from all the foodstuffs. To this total glucose carbohydrate contributes gram for gram, protein 58 grams per 100 grams, and fat 10 grams per 100 grams. An estimate of assimilative power also gains greatly in reliability if during its determination the patient be upon a maintenance diet, or at least one which is equivalent to the basal metabolism and furthermore contains at least the minimum protein requirement of 0.66 grams per kilogram body weight. Theoretically such a basis of classification seems ideal; time will be required to determine its utility.

Any of the above classifications of diabetes denotes the state of the disease at the moment, but gives no information concerning the response of the patient to treatment. For this reason I have recently adopted a working classification planned less upon the severity than upon the present condition. For the purpose of treatment it is not of so much interest to be told that a patient is a severe or a mild diabetic as it is to be informed whether he is doing very well (A), fairly well (B), not very well (C), or is in a dangerous condition (D). To arrive at such a decision is not difficult with a knowledge at hand of the urine (sugar, diacetic acid, albumin), the diet (carbohydrate, protein, fat), the weight, pulse and blood pressure. For convenience, upon the slip which gives these data the letters A, B, C, D are printed. Somehow when you yourself deliberately or someone else deliberately scores your patient (D) it makes more of an impression

upon the mind than simply to gather from the accumulated reports that he is not doing well. This working classification has proven very helpful. I think it will save some lives.

#### PREVENTION OF DIABETES.

It is a pleasant transition from needless diabetic deaths and from treatment to prevention. There is need for the prevention of diabetes in the community because its prevalence is apparently increasing. This is partly explained (1) by the detection of more new cases in the early age periods than formerly, (2) still more by the successful attack of modern science on the infectious diseases, particularly in childhood, with resultant increase of the general expectation of life, so that more individuals reach the susceptible diabetic period, and finally (3) because after diabetes is discovered the patient lives nearly twice as long as a decade ago. This alone adds 2,000,000 of years of diabetes in this country. In 1910 one death in every 95 in this state was due to diabetes, but in 1921 one death in every 62. The likelihood of dying of diabetes today would therefore appear to be 50 per cent. greater than 11 years ago. Although the relative proportion of diabetic deaths to all deaths is increasing, the death rate from diabetes in Massachusetts of late years per 1000 of the population remains stationary.

#### ROUTINE MEDICAL EXAMINATIONS.

If diabetes is to be prevented, we must attack its precursors. Doctors blame patients and patients blame doctors for failing to report or detect the beginnings of disease. What is needed is the development of a spirit of coöperation between doctor and patient. The doctor must practise medicine of such a high standard that the laity cannot fail to appreciate it and see that the trained medical mind can discover diabetes, and other diseases as well, at an earlier stage than the untrained individual. This attitude between doctor and patient is one which must be cultivated. The physician must take pride in educating the families under his care in these principles of preventive medicine. He should teach heads of households to recognize that it is as important for them to keep weight charts of themselves and their children as it is for the state to keep weight charts of children in the schools. The community must be taught that tuberculosis, cancer, heart disease and diabetes in all families should be diagnosed in their incipency, but in intelligent families to a large extent should be prevented. The patient will appreciate a physical examination if it includes a consideration of his weight, height, teeth, tonsils, lungs, heart, abdominal organs, and in addition an examination of his urine. The physician



should point out that students entering college, that soldiers about to enter the army, are all subjected to routine physical examinations, and that these examinations are repeated at yearly intervals. Surely parents would wish to show as deep an interest in their children as professors in their students or generals in their soldiers. The use of scales should be encouraged. A good Christmas present for a family is a pair of scales and a good birthday present for each of its members a complete physical and urinary examination. These measures aim at the prevention or discovery at an incipient stage of all disease. They represent the present trend in medicine which all young practitioners will educate their patients to adopt. Doctors can truthfully say that about the only untaxed commodity a parent can leave his child today is health. The more we doctors promote the routine physical examinations of our patients the less likely will the community clamor for state medicine. Those of us who do not wish this must heed the need, because otherwise it will not be long before free physical examinations will be generally advocated.

#### URINARY TESTS.

The diagnosis of diabetes is made from the examination of the urine. How infrequent such examinations are has been shown from an analysis of groups of cases in which prior to the examination at which the diagnosis was made there was no history of an earlier urinary test. In one series a few years ago the percentage in approximately 100 cases was 39 per cent., and in a recent similar series there was no essential change; namely, 35 per cent. Urinary examinations of all individuals should be made yearly. Elaborate examinations with such needless tests as one often sees recorded, namely, for phosphates, urates, titratable acidity, chlorides and indican, should be abandoned for more frequent simple tests. In all acute illnesses urinary examinations should be made for albumin and sugar, and invariably at the last medical visit the doctor should secure a specimen of urine for his own protection. Never allow a new patient to leave the office without obtaining a specimen of urine. Do not trust to the patient's sending a 24-hour specimen. Each has its own value. In a forthcoming paper from this clinic Horace Gray will point out the great advantages which may accrue from examinations of single specimens of urine and will show that often these are of more service than 24-hour specimens. It is especially desirable to secure specimens of urine within two hours after a meal. Such a sample from one of my patients showed 3.0 per cent. sugar, while the specimen only two hours later was sugar free by Benedict's qualitative test. If the urine is kept sugar free not only in the

24-hour specimen but after each meal, there is seldom cause for worry.

It is safer, as I have repeatedly maintained, to call all individuals diabetics who show sugar in the urine until the contrary is proven. Wait a year at least before positively stating that such an individual, even though he voided but a small quantity of sugar, is not a diabetic. If the sugar in the urine is considerable in quantity and varies with the diet, no doubt about the diagnosis exists. If the sugar in the urine is considerable but does not vary in the least with the diet, the question arises as to whether one is dealing with a case of renal glycosuria. Such cases are extremely rare. I remember to have seen but two in my series when the quantity of sugar in the urine was over 2.0 per cent. The main criteria for a case of renal glycosuria are (1) that the blood sugar shall be 0.11 per cent. or less at the same time as glycosuria is present; (2) that the sugar in the urine be essentially independent of the carbohydrate in the diet; and (3) that the case show its non-progressive character after observation for years rather than weeks or months.

#### BLOOD SUGAR.

Estimations of the blood sugar are useful. They frequently give warning that the patient is reaching his tolerance in diet although the urine remains sugar free. They are a great comfort in cases of pregnancy, because a normal blood sugar in the presence of a few tenths per cent. of sugar in the urine leads to the conclusion that rigid dietetic restrictions are unnecessary, since a renal type of sugar excretion does appear to be a not infrequent fact in pregnancy. Blood sugar estimations are essential in making the diagnosis of renal glycosuria. Blood sugar curves, however, and blood sugar tolerance tests are yet in their infancy. The variations with normal individuals after 100 grams of glucose or after an administration of 1.5 grams glucose per kilogram body weight are most wide. This has been emphasized by Fitz in a paper presented before the American Society for Clinical Investigation in May, 1922. He pointed out that even the absorption of glucose takes place in varying degrees of rapidity from the stomach and consequently often is actually present in the stomach when the blood is taken for examination. A normal blood sugar before breakfast in the morning is usually 0.09 to 0.11 per cent. After 100 grams of glucose it may rise in normal individuals to varying heights, but it is well to be suspicious of any blood sugar above 0.16 per cent. within an hour after a meal, or of a blood sugar which is above 0.12 per cent. at the end of two hours.



## OBESITY.

Obesity has preceded diabetes in fully 75 per cent. of a series of 1000 of my patients. Between 31 and 40 years of age but 12 per cent. of the patients who developed the disease were under weight, and after the age of 40 years 6 per cent. or less. In the thin, according to Mr. Mead of the Lincoln National Life Insurance Company, the incidence of diabetes remains constant throughout life. All other considerations concerning the etiology of diabetes should drop out of account when the possibility is recognized of preventing the disease by simply maintaining a normal weight. If patients can be induced to be vaccinated against smallpox and to be inoculated against typhoid fever they can and should be persuaded to be weighed against diabetes. In securing a record of weights one gains information not alone of value in preventing diabetes but of value in the recognition of many other diseases. It is therefore quite as important for individuals to learn when they are below weight before the age of 35 as it is to recognize that they are overweight after the age of 35. Scales are to chronic disease what thermometers are to acute disease. In a series of 100 of my cases analyzed a few years ago a third acknowledged that they had eaten or drank to excess, and in a more recent series in which more attention was paid to this point two-thirds admitted excess in food. Often the excess took the form of candy (the consumption of one pound a day being repeatedly acknowledged), pies, ice cream, daily and abundantly, one pound of steak at a meal—in short, overindulgence in all caloric directions, non-alcoholic as well as alcoholic, was reported.

## THE PLACE OF THE HOSPITAL IN DIABETIC TREATMENT.

It may appear paradoxical to remark that the hospital with a low diabetic mortality is not performing its function in diabetic treatment, but to a certain extent this is true. During the last few years hospital mortality has decreased from 28 per cent. to 2 per cent., while mortality in private practice still stays high. The reverse should be the rule. The hospitals should have the severer cases and hence the higher mortality. Hospitals where diabetic patients are treated should seek the severe diabetic. Operative cases, particularly cases with gangrene and infections, even though of minor degree, pregnant diabetics, complicated cases, cases with acidosis, and dietetic backsliders should be sent to hospitals; in short, any case not doing well should be in an institution where improvement of the condition can usually be attained and a program outlined which can be followed at home. For cases of these types the general practi-

tioner has frequently neither the time nor the experience. If mild and moderate cases are treated in hospitals methods should be employed which will allow not only the actual dietetic treatment of the case, but the education of the patient to be completed in the shortest space of time. These are the patients whose treatment should be developed by the practitioner, and hospital beds set free for the severe or apparently hopeless cases who need them more. If such a principle is generally adopted hospital mortality may go up, but the general diabetic mortality will surely go down.

Another function of the hospital is to initiate new cases into the dangers and advantages of the diabetic diet. The time required is not long. Undernutrition has shortened it much and the earlier use of moderate quantities of fat has saved several more days. It is a good plan to discharge cases with somewhat less calories than they need. Diabetics are far more liable to add than to subtract from the diet prescribed, though it is really true that errors appear in both directions. The final hospital diet achieved is always a diet suited to the hospital. One never knows what the caloric needs of the patient will be at home. I am steadily sending my cases home earlier and earlier, depending upon return visits in a week, two weeks, or even less frequent intervals, to determine whether the diet fits the demands put upon it. It is a gratifying fact that in a considerable percentage of cases the patients do better outside the hospital than was expected. Such a quick turnover of cases, however, demands increased instruction of the individual patient. He saves rather more in time than the nurse or doctor. Hence the reason for schematic diets and the utmost simplicity in all methods. Informal talks and conferences in small classes and held weekly yield the best results.

Finally to the hospital one looks for the promotion of research. Without research a hospital is stagnant. By research I mean the sort which any hospital can conduct, even though its staff contain the name of no brilliant investigator, the type which is open to us all. In each hospital a consistent plan of treatment should be adopted and an accurate record kept of the immediate and future results therewith attained. This type of research is sure to raise the standard of treatment no matter by whom employed, not only for the one engaged in it, but for fellow physicians, nurses and patients. It is the type of research which can be made worth while by hard work and offers the young clinician an opportunity for useful service. He will find that the field will rapidly broaden, if he but has the vision.

Although it is often true, and it is a matter for regret, that the general practitioner fre-

quently loses close contact with a diabetic case when it enters a hospital, it probably will not be gainsaid that from the hospital have come the advances which have given general practitioners more years of diabetes to treat.

The grouping of diabetic patients in a hospital promotes simplicity and better treatment. Visiting diabetic patients on eight different floors or in eight different wards of a hospital each morning is a ridiculous waste of time. Imagine, if you can, a shoe factory with stitchers working higgledy-piggledy in eight different rooms. For uniformity in care and systematic improvement in the technique of treatment it is hard to see how satisfactory results can be obtained unless all the diabetic patients are grouped to a greater or less extent and under the supervision of one individual. The individual may change from time to time, but for results there must be a policy of treatment and not haphazard treatment. Even if several different physicians treat the cases of diabetes in a hospital each will probably acknowledge that it is to his and the patient's advantage if all the cases are under the supervision of one nurse and all laboratory examinations performed in the same laboratory. If this is true for the nurse and the laboratory can it be any less true for the doctor?

The financial burden of hospital treatment of diabetes is considerable. Patients should be encouraged to take the cheaper beds in open wards. A patient with gangrene may require one or two months' treatment in a hospital. The economic factor is a serious one and should be plainly faced from the start.

Diabetic boarding houses are needed. I know of but one or two such in the state. Probably the best way in which these can be carried on is to have them situated near a hospital where considerable numbers of diabetic patients are treated. In this way they can receive not only patients who are upon the waiting list for admission to the hospital but patients whose discharge could take place a few days earlier if they were in close connection with the hospital. Furthermore, by being so situated they often can accommodate the friends of patients. Diabetic boarding houses are especially good for diabetic children with their mothers. In such a home these children get along far better and give much less annoyance to other patients than when in the hospital.

#### DIABETIC CENTERS.

Centers of instruction for diabetic patients should be promoted. These may form around an individual doctor or a group of doctors or a hospital, but the necessity of such centers is the detailed nature of the instructions which diabetic patients must receive and the expense of the laboratory tests. It is easier to teach a group of patients and far less

time-consuming than to teach individual patients. The time required to perform ten tests for sugar in the urine exceeds by little that required for one test. When it comes to blood sugar estimations the difference in expense between performing ten tests and one is almost negligible. Wholesale methods must be introduced into medical practice to reduce expense and render these tests available for all. Private laboratories should be encouraged wherever they exist, and hospitals, whether private or public, should extend the facilities of their laboratories to physicians in need of the same. The cost of maintenance of a well-equipped laboratory is considerable, but if the plant is kept in operation continuously it can easily pay for itself with very moderate charges. It is the laboratory which only occasionally performs a blood sugar test or but one blood sugar test a day and other tests in similar proportion which needs to charge large sums for maintenance. Physicians must learn to cooperate in their laboratory work just as surgeons have learned to cooperate in their surgical work. Very few surgeons have their own anesthetists; very few physicians should have their own laboratories. The latest and newest methods of treatment are being constantly demanded by patients. If the physicians are not able to furnish the results of these methods and tests at suitable fees then the laity will demand that the state furnish them just as it furnishes diphtheria antitoxin and Wassermann tests.

Nurses who are trained in diabetic treatment are of the greatest assistance to physicians. This will never be appreciated unless tried. For patients, too, who can afford it the simplest way to carry out treatment is to have the diet arranged by a nurse. Severe cases are incomparably better treated in this manner than by remaining in a hospital.

In this year of 1922 diabetes and diabeticians have much for which to be thankful. The mysteries of drugs for diabetes no longer enthrall and the mysteries of the diet are steadily vanishing in the light shed upon them by Allen in his discoveries upon undernutrition, by Woodyatt in his emphasis upon the total glucose value of the total diet, by Shaffer in his establishment of a definite relationship between ketogenic and antiketogenic factors which has elucidated acidosis, and by Newburgh and Marsh, who have shown how remarkably a low protein and a high but limited fat diet can help a desperate case. To all of these investigators we clinicians should be profoundly grateful.

The advances just heralded are so full of promise that they would appear to furnish progress enough for the period, or at least all deserved, but when we think in this strain

we forget youth, young doctors and young countries whose restless, untiring enthusiasm spurs to greater achievement. Now there is no longer need to say "Hope long deferred maketh the heart sick," because of the young Lochinvars of Toronto. All praise to them and to Canadian medicine. The practical ingenuity of the New World has here distanced the Old World hypotheses on intermediary metabolism. Insulin, the name they have given to their pancreatic extract, will temporarily lower the sugar in the blood, banish it from the urine, and promote the accumulation of glycogen and the removal of fat from the liver. Time, patience, and plain prosaic work will do the rest. It may take a decade or more before the treatment of diabetes is as simple as that of myxedema, but all will work the more confidently now that Pisgah's heights have been ascended and the promised land is plain in view.

### Current Literature Department.

#### ABSTRACTORS.

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#### AN AMBULATORY TREATMENT FOR CHRONIC ULCERS OF THE LEG.

GURD (*Can. Med. Assn. Jour.*, Vol. XI, No. 11, Nov., 1921) describes the method of treating chronic ulcers of the leg in ambulatory patients at the Montreal General Hospital, which has been very successful; careful carrying out of the details is of great importance; adhesive strapping is applied about every two weeks by the following method: the leg is thoroughly soaked in washing soda solution and thoroughly cleaned with soap suds and a soft brush, the sloughing material trimmed off, then washed with ether. The patient then lies on his back with the leg held vertically against the wall for one-half to two hours, relieving the leg of oedema and drying the skin thoroughly. The leg is kept elevated somewhat and the strapping applied over both the ulcer and uninjured parts of the leg, in strips from 2.5 to 3.5 cm. in width and long enough to overlap when placed around the leg; starting from the base of the toes, the foot is encircled, each layer overlapping the previous one by at least 1.5 cm., avoiding cutting edges about the malleoli. The strapping is carried up to just below the knee. If the ulcer is discharging freely, a gauze dressing should be applied outside the adhesive over the ulcer and may be frequently changed by the patient. The first dressing is changed at from four to ten days, succeeding ones from two to three weeks later, the same careful and complete technique being carried out each time.

ALAN W. C.

[A. W. C.]

#### NITROUS OXIDE-OXYGEN ANALGESIA AND ANAESTHESIA IN OBSTETRICS.

BOURNE and DUNCAN (*Can. Med. Assn. Jour.*, Vol. XI, No. 11, Nov., 1921) discuss nitrous oxide-oxygen anaesthesia, describe in detail their technique, and most strongly advise its use in obstetrics for the following reasons:

That nitrous oxide-oxygen is the most acceptable to the patient, though it is the most difficult to administer properly; that it is the least harmful known anaesthetic to both mother and child; that uterine contractions are decidedly stimulated, reducing instrumentation; that by changing to 100 per cent. oxygen the moment the child is born there is prompt oxygenation of the child before severance of the cord; it has been established that the uterus in systole absolutely blanches itself, and as these gases are administered only during the rise and acme of systole no nitrous oxide can be conveyed to the foetus during this time. In a well-conducted case the oxygen is commenced at the declination of the systole and continued through the diastole until the uterus is at rest. They emphasize particularly the necessity of this type of administration because by it alone the foetus escapes all possibility of nitrous oxide influence. The results are much better in the toxemias.

[A. W. C.]

#### MALIGNANT DISEASE OF THE THROAT.

SYME (*Can. Med. Assn. Jour.*, Vol. XI, No. 12, Dec., 1921) states that malignant disease affects the oropharynx (tongue and fauces included) in the proportion of 5 males to 1 female, the laryngopharynx in the proportion of 5 females to 1 male, and the larynx 5 males to 1 female; the age averages are 43 in females, 57 in males; in laryngeal cases the age incidence is higher. To emphasize the need of careful investigation when hoarseness extends over a week or two, there is ever so slight difficulty in swallowing, pain on swallowing often shooting to the ear, or cough not explained by findings in the chest. He describes carefully direct examination either by the suspension apparatus or tubes, histological, x-ray, and investigation of involvement of glands.

After covering in detail the various radical and palliative operative procedures, he ends with a plea for earlier suspicion and recognition of malignant diseases in this region.

[A. W. C.]

#### PROGNOSIS AND DIAGNOSIS IN TUBERCULOSIS AS AIDED BY FERROLOGY.

ODGEN (*Can. Med. Assn. Jour.*, Vol. XI, No. 12, Dec., 1921) reports on 100 cases in which the inhibitive reaction was studied. This reaction is a test for the amount of "inhibition" in the blood of tuberculous patients, a body or quality developed in varying amounts at different periods and in different patients; it is a tuberculous antibody only, so that a patient may have a high inhibition reaction and yet be dying of some complication. This test was worked up and a monograph published in 1911 by Caulfield in the *Journal of Medical Research*.

The author finds a marked inhibition reaction rare, corresponding to the clinical observation that but very few patients progress steadily and favorably. In a fair percentage a moderate reaction is present, while most give little or no reaction. He reports several cases in detail, showing the value of the test in prognosis, the cases following fairly well the course predicted by the test. The test should be done at intervals, however, as it does not

always remain the same. The reaction is of but slight value in diagnosis as it is negative so very frequently. In those very doubtful cases who are doing well and who may or may not be tuberculous, it is at times of value, for a positive test in these cases helps to assist in the diagnosis, for the tests are negative almost invariably in normal individuals so far reported.

[A. W. C.]

#### CANCER OF THE STOMACH.

MASSON (*Can. Med. Assn. Jour.*, Vol. xi, No. 12, Dec., 1921) reviews 1912 cases of carcinoma of the stomach operated on at the Mayo Clinic between 1910 and 1921. The average age was 53.7 years, the youngest was 18 and the oldest 81; 40 per cent. occurred in the sixth decade; 78.5 per cent. were in males, 21.5 per cent. in females.

He emphasizes the lack of characteristic symptoms until after the malignancy is well advanced, but states that an expert roentgenologist can find about 95 per cent. of all gastric tumors and ulcers, and that x-ray is of great aid in determining operability, though of course it can never show up metastases. Clinically it is often impossible to tell whether an ulcer is in the stomach or duodenum, and this is very important to know, as malignant degeneration of the edges of a duodenal ulcer is very rare, while the reverse is true in gastric ulcers. He urges that careful and full examination be made of patients with gastric symptoms of a type suggesting ulcer far earlier than at present commonly done on account of this possibility of malignant degeneration; that surgeons explore such patients earlier while radical cure is still possible, and that the laity be taught so far as possible that cancer operated on sufficiently early can be cured.

[A. W. C.]

#### THE INFLUENCE UPON TOXICITY AND TRYpanocIDAL ACTIVITY OF SHAKING ACID AND ALKALINIZED SOLUTIONS OF ARSPHENAMIN AND SOLUTIONS OF NEOARSPHENAMIN IN AIR.

SCHAMBERG, KOLMER AND RAISS (*Am. Jour. of Hyg.*, Vol. v, No. 1, Jan., 1922) describe in detail their method of testing these solutions and give 15 tables showing the results. The authors' conclusions cannot be improved upon in summing up the article.

1. The undue shaking of alkalized solutions of arspfenamin increases the toxicity; the shaking of such solutions is rarely necessary.

2. The shaking of acid solutions of arspfenamin for one minute beyond the time necessary to effect solution is accompanied by a slight increase in toxicity. Ten minutes' extra shaking increases the toxicity still further.

3. The shaking of solutions of neoarsphenamin for even such short periods as one minute is accompanied by a great increase in toxicity. Shaking for ten minutes enormously increases the toxicity.

4. It would appear from the studies of Roth and from those which we have conducted that neoarsphenamin should be dissolved with as little agitation and as little exposure to the air as possible.

5. Different lots and brands of arspfenamin and neoarsphenamin vary considerably in their liability to oxidation on shaking.

6. The trypanocidal power of acid solutions of arspfenamin is considerably increased after one minute of shaking, but is decreased after ten minutes' shaking.

7. The trypanocidal power of alkalized solutions of arspfenamin is considerably increased by one minute's shaking, and the increase is still evident after ten minutes' shaking.

8. The explanation of the increase in trypanocidal power is probably to be found in the formation of "arsenoxide," which is known to exert a greater trypanocidal and spirocheticidal effect than arspfenamin.

9. The shaking of solutions of neoarsphenamin is not accompanied by increase in trypanocidal effect.

[A. W. C.]

#### SARCOMATOUS ABDOMINAL TESTICLE IN A HERMAPHRODITE.

HALPENNY AND KINNEARD (*Can. Med. Assn. Jour.*, Vol. xi, No. 9, Sept., 1921) describe in detail a case of a large sarcoma of an abdominal testicle in a hermaphrodite, filling the pelvis and inoperable, checked by a pathological report, treated by Coley's serum, with death in three months. Unfortunately no autopsy could be obtained.

[A. W. C.]

#### CHRONIC PAIN IN THE RIGHT ILIAC FOSSA.

GRAHAM (*Can. Med. Assn. Jour.*, Vol. xi, No. 9, Sept., 1921) writes about a group of patients with chronic pain, with or without tenderness, in the right iliac fossa. He names the disorders of this region as having to do with abnormalities in the caecum, appendix, ileo-caecal valve, and the terminal ileum; and states that the diagnosis of chronic appendicitis should not be made in these cases unless there is a history of previous one or more acute attacks.

The symptoms described are a lack of feeling of well-being, breakfast is rarely enjoyed, often there is abdominal discomfort in the early morning, while examination shows little except tenderness, which is not severe, on palpation of the right lower quadrant. The x-ray shows ileostasis up to 100 hours or over, while there is more or less incompetence of the ileo-caecal valve, with a marked ebb and flow between the caecum and the ileum.

The author recommends in these cases, which are so frequently diagnosed chronic appendicitis with adhesions and operated on over and over again for breaking up of the adhesions, an extensive operation be done consisting of a resection of the terminal ileum, caecum, and ascending colon to a point proximal to the hepatic flexure. The operation confirms the preoperative diagnosis by showing the caecum dilated and thin-walled, possessing none of the tone or elasticity seen in the normal bowel; it lies flaccid and tends to retain abnormal contours from handling.

He states that in these cases the clinical result is surprisingly good and completely justifies the formidable procedure necessary for its attainment.

[A. W. C.]

#### THE TREATMENT OF IRREPARABLE NERVE INJURIES.

HARRIS (*Can. Med. Assn. Jour.*, Vol. xi, No. 11, Nov., 1921) considers as irreparable nerve injuries those which, though sutured end to end, have failed to recover, and injuries where end-to-end sutures cannot be performed.

Some of the first group result from imperfect suture; in some cases the motor and sensory fibrils become shunted along sheaths belonging to the opposite group and so are lost; some result from pulling apart of the ends, the proximal end forming a neuroma attached to the distal by a strand of scar tissue. Factors causing separation are usually too great tension on the suture or imperfect fixation of the limb after operation, or too rapid flexion of joints after fixation. Irreparable musculo-spiral injuries can be greatly improved by tendon trans-



ference. Irreparable median nerve lesions may be improved by nerve anastomosis to relieve anaesthesia, and tendon transference to overcome paralysis. Irreparable sciatic lesions are better treated by means of stabilizing operations such as tendon fixation, than by tendon transferences.

Several excellent figures from photographs are given.

[A. W. C.]

#### A CLINICAL STUDY OF THE PATHOLOGY OF OSTEOMYELITIS.

GIBSON (*Can. Med. Assn. Jour.*, Vol. XI, No. 11, Nov., 1921) emphasizes the point that inflammation of the bone is just like that of soft tissue except as modified by the nature of the tissue; bone cannot make a rapid offensive on account of its structure. There are two definite types: the juvenile, starting practically always on the diaphyseal side of the epiphyseal cartilage, some fulminating, others slow; and the adult type, where the epiphyses have united with the shafts, starting at any part of the bone, never fulminating.

He tabulates 48 cases as to age, bone affected, apparent cause, etc., and describes two cases showing that the organism may remain in the bone for years, starting afresh at intervals, at times of local or general diminution of resistance. [A. W. C.]

#### A THOROUGH HISTORY AN IMPORTANT FACTOR IN SYPHILIS.

BROEMAN (*Am. Jour. of Syph.*, Vol. v, No. 4, Oct., 1921) notes the difficulty of extracting histories of syphilis from patients years ago, especially when the public looked upon syphilis somewhat differently from the attitude of today; then the discovery of the treponema by Schaudinn and Hoffmann, followed soon by Wassermann's publication on the complement fixation test in 1906, then the prompt and great over-reliance on laboratory tests, with considerable tendency to disregard histories and physical findings; then came a realization of the fact that the Wassermann test is frequently negative in the face of unquestionable syphilis, and occasionally positive in the complete absence of syphilis, and the value of histories and examination again became evident.

Patients should be allowed to tell their own stories in their own way, with a little guidance, however tedious, the examiner thus often giving valuable leads, when the patient is off his guard, which can be followed up in building a good history; this is valuable both in helping to work out the patient's own case and in getting the donor under care. In these days of propaganda in regard to syphilis, patients are less reticent and yet more able to conceal, if that be their desire, through better information.

In regard to congenital syphilis also, the history of the whole family must be most tactfully, but most carefully, gone into; also in acquired cases so as to find any possible accidental infection of contacts, as shown in Schamberg's "epidemic" from playing "kissing games."

[A. W. C.]

#### AGE OF THE RECIPIENT AS A FACTOR IN THE TOXICITY OF ARSPHENAMIN.

ROTH (*Am. Jour. of Syph.*, Vol. v, No. 4, Oct., 1921) describes a series of experiments carried out on white rats at the Hygienic Laboratory to determine whether the weight limits, and consequently the age limits, need be rather definite in the toxicity tests; it is known that within narrow limits the age of rats can be calculated from their weights;

the experiments are given in detail with tables and show that rats of the regulation weight are less resistant to arsphenamin than those below, and more so than those above, pointing to age as an important factor. Accepting Donaldson's statement that a rat three years old corresponds to a man of 90, these experiments would cover a period in man corresponding to that from the end of infancy to the beginning of adult life; this applied clinically should lead to relatively larger doses in infants and children than in later life. Clinically this seems to be checked up by the relatively fewer reactions reported in infants and children than in older persons.

[A. W. C.]

#### SYPHILIS IN THE THIRD GENERATION.

TUMPER (*Am. Jour. of Syph.*, Vol. v, No. 4, Oct., 1921) gives the following seven postulates as required to establish proof of passage of syphilis to the third generation:

1. Acquired syphilis in a grandparent.
2. Certainty of the parentage of the affected parent.
3. Congenital syphilis in that parent.
4. Absence of acquired syphilis in both parents.
5. Certainty of the parentage of the child.
6. Congenital syphilis in the child.
7. Absence of acquired syphilis in the child.

From the nature of things, the first, third and sixth are the only ones which can be absolutely proved. The second and fifth can be assumed if there is a marked resemblance to the supposed father. The fourth and seventh can never be proved, but painstaking history and examination go far to rule out acquired syphilis superimposed on a congenital (binary syphilis) or an accidental acquired syphilis in childhood. He discusses the literature, especially the writings of Fournier and Hutchinson, and concludes by showing photographs of and describing a mother and three children where his seven postulates seem to be as satisfactorily fulfilled as possible.

[A. W. C.]

#### A STUDY OF THE RELATION BETWEEN SYPHILIS AND DIABETES MELLITUS.

ROSENBLUM (*Am. Jour. of Syph.*, Vol. v, No. 4, Oct., 1921) found in 139 cases of diabetes mellitus positive Wassermann tests, suggestive history, signs or symptoms of syphilis in about 12 per cent., and considers about half of them as due to the syphilis and the rest as cases where the two conditions co-exist independently of each other. He gives a long bibliography of the subject.

[A. W. C.]

#### EPITROCHLEAR ADENOPATHY IN SYPHILIS.

RULLISON (*Am. Jour. of Syph.*, Vol. v, No. 4, Oct., 1921) goes into the anatomy and physiology of the lymphatic system in regard to infections in general and syphilis in particular, and gives a good bibliography on the subject. In 252 specific cases of all stages, even including Wassermann-negative, dark-field-positive cases, he found no epitrochlear enlargement in 21 per cent., bilateral in 59 per cent., unilateral in 20 per cent., combined in 79 per cent. In 43 non-specific cases he found no enlargement in 77 per cent., combined positive in 23 per cent. In a group of 11 cases with the disease over 20 years he found 90 per cent. with positive findings. He found relatively fewer positive cases in central nervous system syphilis. Treatment did not seem to cause complete resolution of epitrochlear adenopathy. Other causes of the condition



are given: the other granulomata, carcinoma, lymphatism, acute eruptive fevers, leukaemia, Hodgkin's disease, thachitis, infections of the hand and forearm, chronic generalized pruritus from any cause.

[A. W. C.]

## SILVER ARSPHENAMIN.

GUY AND JACOB (*Am. Jour. of Hyg.*, Vol. v, No. 4, Oct., 1921), after using silver arspphenamin in a group of cases, arrive at the conclusions that the drug is worthy of a trial, but that changes in the present mode of therapy, as discontinuing mercury, are not indicated at present; that the drug is best given in concentrated solution mixed with blood before injection; that it might work well where arspphenamin is not tolerated; that, weight for weight, it is more toxic and less effective than arspphenamin.

[A. W. C.]

## AMOEBIIC LIVER ABSCESS.

ROGERS (*Brit. Med. Jour.*, Feb. 11, 1922) discusses the condition of amoebic liver abscess and summarizes his opinion as follows:

"The affection formerly known as tropical liver abscess, both in the acute multiple small form and the chronic large single form, is produced by infection through the portal vein with the *Entamoeba histolytica*, only occasionally assisted by bacteria, and is always secondary to antecedent amoebic ulceration of the large bowel, which is clinically active and acute in the multiple variety, but usually completely latent clinically in the more chronic single form, while such abscesses never occur in relation to bacillary dysentery. These conclusions are a great advance on the view generally accepted two decades ago."

[J. B. H.]

## IMMUNOLOGICAL REACTIONS OF BENCE-JONES PROTEINS. 1. DIFFERENCES BETWEEN BENCE-JONES PROTEINS AND HUMAN SERUM PROTEINS.

BAYNE-JONES AND WILSON (*Johns Hopkins Hosp. Bull.*, Feb., 1922) discuss the complex subject of the difference between the Bence-Jones proteins and human serum proteins, summarizing their work as follows:

1. The crystalline Bence-Jones protein acts as a single antigen.
2. The non-crystalline preparations of Bence-Jones proteins, isolated from the urine by salting-out or other precipitation methods, contain traces of serum proteins.
3. The Bence-Jones proteins are immunologically different from the proteins of normal human serums.
4. These differences between proteins from the same animal are further evidence in support of the conception that the specificity of proteins is not dependent upon their biological origin, but due to their chemical constitution.

[J. B. H.]

## YAWS: AN ANALYSIS OF 1046 CASES IN THE DOMINICAN REPUBLIC.

MOSS AND BIGLOW (*Johns Hopkins Hosp. Bull.*, Feb., 1922) in a most interesting article illustrated with very remarkable photographs, present the latest knowledge on the subject of this tropical disease.

The article does not admit of adequate review but should be read by all interested in tropical medicine. The photographs alone make this paper of extraordinary interest.

[J. B. H.]

## FEBRICULA AND INFLUENZA.

SIMEY (*Brit. Med. Jour.*, Jan. 28, 1922) discusses what he calls influenzoid group of diseases as they occur in a large boarding-school, in this instance Rugby. His conclusions are as follows:

1. The influenzoid group of diseases may be subdivided for clinical convenience into two groups:

(a) Localized infections, with slight toxæmia—namely, coryza, catarrh.

(b) General infections, with much toxæmia and possibly septicaemia—namely, febricula, influenza.

2. The severity of symptoms in the second group depends partly on the susceptibility of the patient and partly upon the proportions of the various micro-organisms present, their strains, and the contaminating organisms present. It may be that there are some ultra-microscopic micro-organisms of whose existence we are, as yet, unaware, but I cannot help thinking that the bacillus of Pfeiffer is rightly named *B. influenzae*.

3. Partial and temporary immunity is conferred by an attack of febricula against influenza and by influenza against febricula.

4. Vaccines, therefore, to be most efficacious, should be specially prepared from local material, and in an epidemic these vaccines should be systematically reinforced to keep pace progressively with the advance of the disease.

[J. B. H.]

## TUBERCULOSIS OF THE LYMPHATIC SYSTEM.

PHILIP (*Brit. Med. Jour.*, Jan. 28, 1922) summarizes his remarks on tuberculosis of the lymphatic system as follows:

1. The part played by the lymphatic system in the early spread of tuberculosis requires to be emphasized.

2. Patients should be examined with that in mind, and the more important groups of glands should be systematically reviewed. In cases of general delicacy, all the readily accessible lymphatic glands should be carefully investigated.

3. In young children, the lymphatic system should be investigated with especial care, from time to time.

4. Lymphatic tuberculosis, conspicuous in children, becomes less marked in later life.

5. In cases of gross enlargement of one or more glands, exacting search should be made into the state of adjacent glands and other groups of glands.

6. Operative treatment should be limited to emergencies—for example, the immediate removal of an ugly deformity in certain cases or the evacuation of an obviously softened gland.

7. Save in exceptional cases, such operative treatment should not involve extensive incision.

8. Operative treatment should not be regarded as radical.

9. Tuberculous involvement of the lymphatic system can be effectively combated by continuous vaccine therapy.

[J. B. H.]

## SOME FUNCTIONS OF THE SUPRARENAL GLANDS.

HEWES (*Brit. Med. Jour.*, Jan. 28, 1922) presents her conclusions concerning the functions of the suprarenal glands as follows:

1. The suprarenal cortex plays a part in fat metabolism and in calcium metabolism.

2. The suprarenal cortex stimulates the thymus to involution.

3. The suprarenal cortex controls the gonads in both male and female with respect to both reproductive and interstitial cells.

4. The suprarenal gland acts as a whole in con-

trolling general health, in controlling haemoglobin breakdown, in regulating the production of mast cells, and in stimulating the thyroid.

5. The suprarenal medulla is connected with the formation of melanoblast cells.

6. Inoculation with various suprarenal extracts appears to lower the resistance of experimental animals, as is indicated by the condition of the lymph and haemolymph glands.

[J. B. H.]

#### SOME OBSERVATIONS ON THE INVESTIGATION OF THE TOXAEMIAS OF PREGNANCY.

MILLROY (*Brit. Med. Jour.*, March 4, 1922) discusses the various toxæmias of pregnancy and the general principles of treatment, concluding as follows:

"We must bear in mind that the main number of severe cases are preventable if treatment can be given in their early stages. Every pregnant woman should be kept under medical observation, and every case of albuminuria should be investigated. Every premature birth should be notified, no matter at what period of pregnancy, and facilities should be given for examination of the ovum. The public health authorities should take up the question of toxæmia of pregnancy just as they have taken up the question of syphilis. Ante-natal beds should be provided in all maternity hospitals. Financial facilities should be given to research workers, especially in the domain of physiology, for the investigation of the normal function of human pregnancy."

[J. B. H.]

#### THE POSITION OF THE THYROID GLAND IN THE ENDOCRINE SYSTEM.

BROWN (*Brit. Med. Jour.*, Jan. 21, 1922) discusses in an interesting way the various activities of the thyroid gland, summarizing his remarks as follows:

We are thus led to the conclusion that the position of the thyroid gland in the endocrine system is that of a powerful activator of metabolism. In this respect it co-operates with the adrenals and pituitary, and antagonizes the pancreas and parathyroids. On the nervous side it co-operates with the sympathetic nervous system, both being stimulated to increased activity by it and lowering the threshold to it. In this way it plays an important part both in external and internal defence. Externally it leads to greater manifestation of energy in the direction of fight or flight; internally it quickens the reactions to bacterial invasion. An important way in which it accomplishes this is by mobilizing the blood sugar. This increased supply of sugar may either be used for muscular energy in external defence or for heat in the febrile reaction of internal defence. As a provision against waste of this sugar the kidney threshold is raised to prevent its escape into the urine, so that despite hyperglycaemia there may be no glycosuria. Yet this blood sugar may exceed even this raised threshold, so that some escapes. This is particularly likely to occur during emotional excitement, when the gland is apt to enlarge. It interacts also with the gonads, and the undoubted fact that it plays a more active part in female metabolism may be due to its origin from the uterus of a Palaeozoic ancestor. This interaction may account for the disturbances which are so apt to occur in the gland after an artificial or natural climacteric. That in the former instance this is likely to take the form of intermittent hyperthyroidism may be due to the gland being still in full activity; in the latter instance hypothyroidism is more common, presumably

because the gland is already undergoing retrogression. The combination of a distressing emotion of matrimonial origin with a toxæmia of alimentary origin is the most fertile cause of hyperthyroidism, and the biological consideration here presented may help to explain why this is the case.

[J. B. H.]

#### THE CLINICAL IMPORT OF HOARSENESS IN RELATION TO GENERAL PRACTICE.

WATSON-WILLIAMS (*The Practitioner*, March, 1922) in a plain and practical article, illustrated with various diagrams, discusses the different kinds of hoarseness, emphasizing the fact that it may be an early symptom of malignant growth of the larynx.

[J. B. H.]

#### DEEP X-RAY THERAPY IN MALIGNANT DISEASE.

WEBB (*Brit. Med. Jour.*, Jan. 21, 1922) believes as follows in regard to deep x-ray therapy in the treatment of malignant disease:

1. That this form of treatment is a fundamental and epoch-marking improvement on pre-existing methods of x-ray therapy, and is the technique to be adopted in all cases (other than purely superficial skin lesions) where this form of therapy is indicated.

2. That, as in all other treatments, the earlier a suitable case is treated, the better are the results.

3. That it is the treatment of choice in all cases of menorrhagia or metrorrhagia in patients over 38, provided that suppurative disease of the tubes or ovaries be excluded. Eden and Povis (*Lancet*, Feb. 12, 1921) are in agreement with the use of x-rays in these conditions, though they differ from the German school in excluding cases of malignant disease. It must, however, be remembered that they were not employing the Erlangen technique.

4. All the foreign authorities agree as to the immense value in every malignant case of either pre- or post-operative raying, or both, according to circumstances, and the majority—excluding Professors Seltz and Wintz and their immediate disciples—recommend operation according to the conditions that I have laid down above.

5. Great use is made of deep x-ray therapy in tuberculous disease of the glands, bones, joints, bladder and peritoneum as an auxiliary to other treatments. If in tuberculous glands there be a caseous focus, such glands will break down under the treatment.

[J. B. H.]

#### THE GROSS PATHOLOGY OF BRACHIAL PLEXUS INJURIES.

ADSON (*Surg., Gyn. and Obst.*, March, 1922) writes that injuries of the brachial plexus, except those injuries in which the pull is downward and outward, are situated in the vicinity of the intervertebral canal proximal to the brachial trunk. The injuries may be slight, lacerating only the fascia around the cervical roots, or they may be severe and result in laceration of the cervical roots between the cervical ganglion and the cervical trunk, with or without avulsions of the ganglion. Inasmuch as injuries of the brachial plexus are produced in the root or the ganglion, they seem primarily to be lesions of the nerve rather than secondary to lesions of the shoulder joint. Patients with milder injuries may be expected partially or completely to recover without surgical treatment, but those with more severe injuries rarely recover, even with surgical treatment.

[E. H. R.]

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### THE SHATTUCK LECTURE.

Before presenting the speaker the president gave a brief outline of the gift of the late Dr. George C. Shattuck. Under the provisions of this gift it has been possible to secure eminent physicians who have delivered, on the evening of the first meeting day of the anniversary exercises, a lecture on some important medical subject. Dr. Elliott P. Joslin was then presented and spoke on "The Treatment of Diabetes Mellitus."

This recital of practically all the known facts relating to diabetes mellitus, together with the author's experience and personal views of the indicated treatment of this disease, has placed before the profession in available form the methods employed in dealing with the disorder *per se* and the complications encountered. Every practitioner who may be called upon to deal with diabetes should refer to the material presented in this lecture, for it not only gives the scientific foundation of treatment but in addition presents illustrations of those effects of the disease which patients should understand in order to lead to effective coöperation. It was shown in a most forceful way that faithful adherence to the physician's orders is the only safe path to tread. In order to secure this coöperation the exhibitions of the amount

of sugar excreted in a day and the comparative bulk of carbohydrate-containing foods were object lessons which would appeal to every intelligent person. The dangers incident to unscientific variation of the diet and mechanical injuries were made so clear that there is no excuse for carelessness on the part of the physician who is responsible for the patient's welfare. The assertion that the development of diabetic coma is proof of carelessness or ignorance carries with it consolation and apprehension, for it places on the physician the duty of immediate study of the conditions of the diabetic patient in order that the danger, which is not always frankly apparent, may be averted. If not impending, the medical adviser may be consoled in the feeling of security conferred by the knowledge that he can, by careful attention, place the whole responsibility on the patient or those in charge of details. In like manner the responsibility for many of the complications may be transferred if the physician will perform the duty involved in clear explanation of those things which the patient is entitled to know.

This lecture, like many others provided for by the Shattuck fund, has placed the society under lasting obligation to the donor, and also to those who have been selected to meet the conditions imposed.

This lecture was a notable feature of an interesting and profitable program.

### THE GORGAS MEMORIAL INSTITUTE.

IN our issue of January 19, 1922, was a description of the Gorgas Memorial Institute of Tropical and Preventive Medicine, to be established in Panama. The subject was brought before the annual meeting of the Massachusetts Medical Society on June 14, when Dr. F. B. Lund and Dr. R. P. Strong described the project anew and solicited the interest of the society and of the American public, through its fellows, in such a praiseworthy memorial to one of the great men in American medicine. On motion by Dr. Albert Evans, the society voted unanimously to appoint a committee of five, the members being selected by the president, to coöperate with the officers of the Institute in helping to raise the Gorgas Memorial Endowment Fund.

As has been stated, the Republic of Panama has donated a tract of land and a building, to cost \$500,000. An endowment fund of \$6,000,000 is required to carry on the Institute. The plan of the Institute is to prosecute investigations in tropical and infectious diseases by means of research laboratories in bacteriology, entomology, helminthology, protozoology and chemistry, acting in conjunction with the neighboring excellent hospitals of

Ancon and Santo Tomas, to elucidate problems that can be studied only at first hand in the tropics. Graduate students of any recognized medical college are to be received in the Institute and a limited number of research workers, the hope being entertained that members of scientific faculties will avail themselves of its opportunities. What a splendid memorial to a sanitary chief, erected by a grateful republic on territory that Gorgas made habitable!

Major-General William Crawford Gorgas died at Mobile, Alabama, July 4, 1920, at the age of 65. He had retired from the army in 1918 and was, at the time of his death, director of the yellow fever research department of the Rockefeller Foundation. Through his labors the civilized world had been freed from the curse of yellow fever. Research advances had been made in this disease even before he had passed to the great beyond, for Hideyo Noguchi, of the Rockefeller Foundation, had isolated the cause of yellow fever, the *leptospira icteroides*, and Gorgas was present at the first serum treatment founded on this discovery, in the case of an American marine on board the U. S. S. Chicago, off Honduras, in September, 1919. More recently prophylactic inoculation has been practised upon individuals who are about to enter those scattered areas remote from civilization where epidemics of the disease still occur, by the use of killed cultures of the *leptospira*.

The Gorgas Institute was incorporated under the laws of Delaware in October, 1921. Rear Admiral W. C. Braisted, formerly surgeon-general of the navy and also president of the American Medical Association, is president. The scientific directorate, headed by Dr. R. P. Strong, includes such men as W. G. MacCallum of Baltimore, E. E. Tyzzer of Harvard, W. M. Wheeler, dean of the Bussey Institution, Admiral F. R. Stitt and Lieutenant-Colonel J. F. Siler. There is a strong board of trustees, a finance committee, to invest and care for the funds, and an advisory council made up of leading public men of North, Central and South America.

This international organization, founded in memory of a great sanitarian, for entirely unselfish purposes, will appeal to the American people, who not only possess idealism in a large measure but have a proved ability to produce results. Let the medical profession spread the story of the Institute and its requirements among their friends.

#### SOME FEATURES OF MEDICAL EDUCATION.

In very early times students of medicine learned the art through a period of appren-

ticeship. With the creation of medical schools most of the teaching was for a long period by means of lectures, and later clinical exercises came into general use in supplementing theory by the recital of fact. The accepted methods of today involve a form of hospital apprenticeship supplementary to the four years' medical school work under the title of house officer or interne. This interne service has become an essential feature of medical education and is practically universal with ambitious and well-qualified students. Hospitals have become, in a large sense, teaching institutions, because it has been found that the teaching of doctors and nurses is an essential part of hospital service. Except in the cases of a few hospitals maintained as private enterprises, the public has a right to demand that in addition to giving the best possible service to the patients, physicians and nurses should be trained so that the benefits of such institutions should be extended beyond their walls and reach all who later come under the care of those educated therein.

A special problem relating to interne service is now calling for solution, for, coincident with the development of scientific medicine, the necessity of extending the advantages of better service to the greatest number of people imposes on schools and hospitals the responsibility of preparing practitioners for the best possible treatment of the sick. Hospitals provide for those who can and will enter them. Practitioners should render as high-grade service in the home as conditions will permit, so that one may ask at this time: Can or should the training of internes be changed in any way which might enable the future patients of the present-day internes to derive greater benefits? This question has brought forward differences of opinion. It is quite probable that teachers in medical schools and the management of the large hospitals will feel that applicants for interne positions should elect a certain department, for example, surgery, and continue in that service throughout the interne year. Others who contend that we need a greater number of men trained in the general application of surgical, medical and obstetrical methods may feel that house officers should be given a rotating service. This matter has engaged the attention of state examining boards, and since these men are taken very largely from the ranks of general practitioners one can readily understand the contention now being made by state examiners that applicants for state registration should have had a rotating interne service.

While this question is not likely to call for general discussion among Massachusetts state officials for some time, because the probability of getting any radical change in our state law



is small, it is a matter of concern for our medical schools and hospitals. For example, a student informed the dean of one of our schools that he could not take an internship in one of our largest hospitals because he wanted to settle in a state which requires that applicants for registration should have served a rotating internship. This student was misinformed about the particular state in question, but the fact remains that he had become aware of the possibility of this requirement in some states. At the present time twelve states in the Union demand that applicants for registration in medicine shall have served an internship of one year. These states are Delaware, Indiana, Iowa, Michigan, New Hampshire, New Jersey, North Dakota, Oregon, Pennsylvania, Rhode Island, Washington and Wisconsin, and Texas will enter this list in 1925. Four of these—Delaware, New Jersey, Pennsylvania and Rhode Island—demand a rotating interne service. One state only gives a three months' credit for a continuing year in one special service. Officials of Indiana, Michigan, North Carolina, North Dakota and Texas believe that the rotating service is desirable. Michigan had adopted this requirement but subsequently held it in abeyance for further study.

This subject does not, of course, interest the great mass of present-day practitioners, but it is evident that the matter is agitating the minds of educators and state board members and will come up for discussion. The influence of the Council on Medical Education will be important when its attitude shall have been announced, and state boards will be inclined to reflect the opinions of our leaders so far as laws permit. One very good solution may be found in the adoption of plans for the more general education of students during the school and hospital year and advising prospective specialists to take extended courses after the general hospital year. At some future time students may be examined with the purpose in view of ascertaining the fitness of a given person for certain kinds of work. During the war no one could be an aviator until recognized tests had been taken and fitness demonstrated. Why should not the prospective surgeon have poise and mechanical ability? If the aviator was not equal to his task he would be very sure to be his own first victim. The poorly constituted surgeon would escape personal danger only to pass it on to his patients.

The plan may be adopted at some future time of classifying students in medical schools so that there will be fewer misfits among practitioners. If the schools do not do this, state boards may eventually be called upon to require special fitness of those who are ambitious to be known as specialists. During the war

it was found that some so-called specialists did not measure up to recognized standards in service. The government may at some time demand as good care for the civilian as was provided for the soldiers, and the guidance of the medical student into departments of work according to his natural aptitude may be of assistance in providing the most efficient service.

#### LEGISLATIVE MATTER.

PROMPT attention should be given to the annual registration required by the Harrison narcotic law as recent activities of the Internal Revenue Bureau indicate an energetic enforcement of its provisions regarding delinquencies.

This activity is shown in the recent report of the federal grand jury which returned indictments against two physicians for failing to register as required.

In the Massachusetts district last year there were 1350 delinquents, the majority of them being among the medical profession, and for many it was their second or third offence.

The delinquents, in some instances, declined to take advantage of the opportunity to make an offer in compromise which would settle the cases, and when this was reported to Washington instructions were issued to place the cases in the hands of the United States district attorney.

This course was followed and the result of the proceedings is shown by the two indictments, the first in this state since the Harrison narcotic law went into effect.

Registration made at the office of Collector Malcolm E. Nichols on or before July 1 will preclude the possibility of similar action by government agencies in the future.

#### HEART DISEASE IN BROOKLINE.

THE Brookline Board of Health reports that more residents of that town die of heart disease than from any other cause. Following this statement is a dissertation on the causes of heart disease suitable for lay reading, which is an unusually clear exposition of the dangers and problems involved. The rest of the *Bulletin* (June, 1922) is especially interesting and instructive.

#### NEWS ITEMS.

EASTERN HAMPDEN MEDICAL ASSOCIATION.—The last regular meeting of the Eastern Hampden Medical Association before the summer vacation was held at the Springfield Acad-



emy of Medicine, Thursday, June 8. Considering the theme, "Peptic Ulcer," papers were presented on "The Internist's Viewpoint," by Dr. F. F. Dexter, and "The Surgeon's Viewpoint," by Dr. J. M. Birnie. Brief case reports—"Gastric Ulcer," by Dr. F. C. Brigham, and "Perforated Gastric Ulcer," by Dr. H. F. Budington—were given, after which was a general discussion, followed by the usual luncheon. This association, now in its 43-d year, originated in 1880 by the gathering of a small group of physicians from month to month at the homes of the different members, but its usefulness has appealed to so many physicians of the valley that it was long since found necessary to meet in some convenient center to accommodate its increased membership. The custom of meeting on the "Thursday on, or before the full moon," inaugurated at the start, when the country roads were long and mostly dark, is still continued.

Dr. E. Y. MYERS, *Secretary*.

**MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.**—The second meeting of the Medical Women's International Association will be held at Geneva, Switzerland, from the 4th to the 7th of September, 1922. All members are urged to be present. Each society of medical women in the world is invited to send one eligible delegate and an additional delegate for every hundred members. Interesting reports will be read by medical women from different countries, and the constitution of the organization will probably be revised in accordance with the provisions under which it was adopted. Clinics in the different European cities may be visited en route. The attractions of travel in Europe are great this year. Practically all countries are accessible and the Passion Play will be on at Oberammergau during the entire summer.

**BOSTON PHYSICIAN ACCEPTS HIGH POST.**—Dr. Nathaniel W. Faxon, assistant director of the Massachusetts General Hospital of Boston, has accepted the position of director of the Strong Memorial Teaching Hospital, Rochester, N. Y., which will be built in connection with the new School of Medicine and Dentistry of the University of Rochester. He will arrive in Rochester next fall.

As superintendent of the Strong Memorial Hospital he will have charge of an institution of 220 beds. It will be erected from the \$1,000,000 given by Mrs. Gertrude Strong Achilles and Mrs. Helen Strong Carter as a memorial to their father and mother, Henry A. Strong and Helen Phoebe Strong. This pledge was made following the gifts of \$4,000,000 by Mr. George Eastman and \$5,000,000 by the

General Education Board for the establishment of the School of Medicine and Dentistry. The Rochester Dental Dispensary, built and endowed by Mr. Eastman in 1916 at a cost of \$1,800,000, will come under the control of the university and be used as a clinic for the School of Dentistry.—*Boston Herald*.

Dr. JOHN ROBERTSON, Medical Officer of Health for Birmingham, has left for America, in order to investigate the methods of milk production and distribution in the United States.—*Medical Press and Circular*.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending June 10, 1922, the number of deaths reported was 164, against 195 last year, with a rate of 11.16, against 13.42 last year. There were 25 deaths under one year of age, against 32 last year.

The number of cases of principal reportable diseases were: Diphtheria, 37; scarlet fever, 32; measles, 188; whooping cough, 10; tuberculosis, 54. Included in the above were the following cases of non-residents: Diphtheria, 1; scarlet fever, 8; measles, 1; whooping cough, 1; tuberculosis, 2.

Total deaths from these diseases were: Diphtheria, 1; scarlet fever, 1; measles, 1; tuberculosis, 9.

Dr. EDWARD G. WEST, for 20 years medical director of the Massachusetts Mutual Accident Association and a medical examiner for various life insurance companies, died at his home in Roxbury, June 10, 1922, at the age of 67.

He was born in Philadelphia, Pa., January 3, 1855, was educated at Phillips Exeter Academy, Boston Latin School and at Harvard College, where he graduated with the class of 1877. Three years later he took his M.D. at Harvard, joined the Massachusetts Medical Society and began practice in Roxbury. Besides his insurance work he testified in court as an expert for many years. He was a member of the Norfolk District Medical Improvement Society and of the American Medical Association.

Dr. PHILIP A. E. SHEPPARD has forwarded a letter to the secretary of the Massachusetts Medical Society, in which protest is made against the editorial notice in THE JOURNAL of the hearings before the Board of Registration in Medicine. Because of this editorial Dr. Sheppard has tendered his withdrawal from the society. On October 26, 1921, the committee on ethics and discipline of the Massachusetts Medical Society asked Dr. Sheppard to resign.

### The Massachusetts Medical Society.

#### THE ONE HUNDRED AND FORTY-FIRST ANNUAL MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY.

The exercises of Tuesday, June 13, 1922, began with visits to the Boston Hospitals from 8.30 to 9.45. The Sections began their sessions in the Buildings of the Harvard Medical School at 10 o'clock. These Sections were well attended, as follows: Surgery, 150; Department of Chemistry, about 200; Pediatrics, 90; Medicine, about 150; Hospital Administration, about 50; Department of Hygiene, about 150; Physiology, about 100; Tuberculosis, about 200. These figures show a great deal of interest on the part of the society members, corresponding with the relative attendances in pre-war times.

The Council Meeting, although the business was pushed through without delay, lasted two hours and a half. There were 115 councillors present. The President spoke with evidence of deep emotion of the death of several members of the Council, and paid a high tribute to Dr. Edward H. Nichols, whose death was announced in the morning papers. He stated that the year had been most successful, the Society having a membership of over 4000, and that he had found the several districts interested in local and state affairs. Allusion was made to the relatively large membership in the eastern sections of the state which made for undue concentration of power, which could only be avoided by closer amalgamation with the more remote districts. A valuable feature of society activity as shown in the joint meetings conducted last year was referred to, and the hope expressed that there would be united purpose and action in the future.

The reports of standing committees were read and were approved. Dr. S. B. Woodward announced his retirement from the Committee on Membership and Finance in a communication which is herewith reproduced:

#### "Members of the Council—Gentlemen:

"Since 1888 I have many times been honored with an appointment to one of your standing committees, for I served nine years on the Committee to Procure Scientific Papers, five on the Committee of Ethics and Discipline, three on the Committee on State and National Legislation, and have just completed my second year as a member of the Committee on Membership and Finance. You have also six times sent me to represent you at the meetings of other State societies, twice to New York, twice to Connecticut, once to Rhode Island, and once to New Hampshire. I served you one year as Vice-President, and three years as President.

"I am approaching the time when the grasshopper is said to be a burden, and although I dislike to acknowledge it, have passed by some kilometers the stone that our judicious predecessors decreed might be regarded as the age of retirement. I feel, perhaps, rather late in life, that there should be a wider distribution of offices. I feel that I have been sufficiently, indeed, far too much, honored, and early in the year informed Dr. Bartol that I was not a candidate for re-election to the Committee for which I have just reported.

"He was kind enough to say that he was sorry to have me go, but thought my position well taken. He said nothing about barnacles or the difficulty often experienced in prying an officeholder from his perch, but I cannot thus for the first time in over 40 years refuse to undertake anything that the Massachusetts Medical Society asks me to do without expressing to it, through you, my continued loyalty to it, my gratitude for all that it has year after year done for me, and without assuring you that as long as I can totter hither, hither I shall totter, for owing to a blessed provision of the by-laws, my own district cannot turn me out, I being, as Ex-President, Councillor in perpetuity, or at any rate, subject to removal only by expulsion from the Society."

The vacancy was filled by the election of Dr. David N. Blakely.

The Committee on Public Health, through Dr. Bigelow, the chairman, failed to secure the approval of the Committee on Membership and Finance, for an appropriation of twenty-five hundred dollars for field work. The contention of the Committee on Finance being that a sufficiently detailed report had not been submitted to enable this Committee to determine the propriety of this expenditure. Dr. Bigelow tried to present a motion amending the motion in support of the Committee on Finance which would secure some modification of the total rejection of the plans which the Committee on Public Health has under consideration, but was ruled out of order. Subsequent discussion in private disclosed a feeling that there may be an unintentional discrimination against the Committee on Public Health, for in asking for an appropriation a common custom has prevailed in past years of appropriating money for the use of a committee for study and investigation without the presentation of definite figures. It is reasonable to hope that the Committee on Public Health will not interpret the action of the Council as antagonistic, or without due appreciation of the work done in the past. The Committee on Finance is in a logical position because the report of the Public Health Committee did not technically come before it in season for consideration. for although a statement had appeared in THE JOURNAL, the

Committee on Finance did not regard that as a communication directly to it.

The Committee on Medical Education and Medical Diplomas gave a résumé of legislative activities and the meetings in Chicago. The Universities of Alabama and Fordham were added to the approved list of medical schools. A tribute was paid to the activity of some of the medical societies which seemed to be effective in changing the attitude of some members of the Legislature towards the problems of state requirement for higher medical standards.

The Committee on State and National Legislation gave a detailed report of legislative activities which, when published, will place clearly before the Society the amount of work done. Progress has evidently been made in changing public sentiment toward antvivisection, anti-vaccination, and the cults, and the outlook for better laws is encouraging.

The Insurance and Workman's Compensation Committee tendered reports and were discharged.

Dr. B. P. Croft of Greenfield presented a statement with motions and a resolution as follows:

*"Resolved, That the members of the Franklin District Medical Society, recognizing the great importance of closer contact of the District Societies with the parent body of the Massachusetts Medical Society, through the medium of the Council, believe that such contact would be facilitated if the distance to the meeting place and the financial cost of reaching same were more equally distributed, and therefore, we recommend that our Council members offer and support the following motions, provided that their subject-matter has not already been acted on or that they are not unconstitutional:*

*"1. That one or more of the Council meetings be held in Springfield or Worcester.*

*"2. That the expense of carfare of all Council members attending the Council meetings be paid from the treasury of the Massachusetts Medical Society.*

*"3. That the treasurer of the general Society prepare an estimate of the approximate cost of carrying out the purpose of the resolve.*

*"Resolved, That previous to final action by the Council, a copy of this resolution be transmitted by the secretary of the Massachusetts Medical Society to the secretaries of all District Societies, with the request that its subject matter be acted upon at a meeting of the respective societies, and the result of such action be communicated to the Council through the Secretary."*

These are important measures and should receive careful consideration.

Dr. C. E. Mongan of Somerville introduced a motion in favor of a Section of Obstetrics and Gynecology, which was adopted. The President was authorized to select the first officers of this Section.

In addition to the motion for the creation of a new section, Dr. Mongan asked the Public Health Committee for a definition of the term Public Health and the functions of a public health nurse.

The technical details of business transacted will appear in the Secretary's report.

The result of the Ballot for Officers for the ensuing year was as follows:

President—Dr. John W. Bartol.

Vice-President—Dr. Charles E. Mongan.

Secretary—Dr. Walter L. Burrage.

Treasurer—Dr. Arthur K. Stone.

Librarian Emeritus—Dr. Edwin H. Brigham.

Orator—Dr. Roger I. Lee.

Several matters of interest, such as the movement to contribute to the Gorgas memorial, will be given attention in future issues.

#### THE ANNUAL DINNER.

ABOUT five hundred fellows participated in the annual dinner on Wednesday evening at the Copley-Plaza. The post-prandial entertainment began about 8 o'clock. The President introduced the speakers with witty allusions to the personality or position of each one, a text being supplied for the respondent so that the opening remarks could be built on the inspiration furnished.

Governor Cox was enthusiastically received as the representative of the "Hub of the Solar System." He said in substance that he was familiar with the representative members of the profession all over the state, and paid tribute to the preëminent quality of service contributed by the members of the profession in civic as well as professional affairs. In referring to the law governing medical registration he acknowledged the humiliating position of this state in failing to require higher standards, but found consolation in the small degree of betterment attained the past year in the amendments to the narcotic drug laws, the appropriation of \$15,000 for the investigation relating to maternal and infant hygiene, and the rejection of the Sheppard-Towner act. He asserted that he found the majority of our people self-reliant, progressive, and supporters of churches, schools, institutions and the government, always holding to the noblest traditions, and urged his audience to see to it that there is no spirit of decadence in the nation.

In introducing the next speaker allusion was made to the safety conferred by our laws. Thomas C. O'Brien, the district attorney for Suffolk county, was presented. He spoke of the close contact of medicine and law in the affairs of the state. His message had for its

central thought the menace of the drug evil, with which he had become familiar before assuming the duties of his present office, through membership on the Parole Board. He stated that we use seven times more narcotic drugs than any other nation. The need for these drugs does not exceed three tons, whereas 365 tons are consumed annually. The use of these drugs constitutes a national danger, for, if not checked, this nation would become quite universally degenerate within 25 years. He asked for medical coöperation, for many addicts are found who fell by reason of lack of care on the part of physicians and nurses. He believed that there are one million addicts in this country today and the average individual expense is five dollars per day. Many criminals are recruited from the ranks of drug addicts. He declared that while he had sympathy for the unfortunate addict, he had none for the peddler or careless doctor and would send the criminal peddler and doctor to prison for the maximum term.

In introducing the Hon. B. Loring Young, Speaker of the House of Representatives, the President explained the fundamental importance of the work done by our legislators, to society, and paid tribute to the assistance given to our committee on legislation by the Speaker of the House. Mr. Young gave a clear exposition of the problems relating to medical legislation and reviewed the efforts that have been made to secure better laws, paying especial attention to the bill providing for higher pre-medical standards, the necessity of safeguarding the student engaged in clinical study, and the proposed changes which will be applied to the management of the tuberculosis institutions. He explained all the features of the various maternity benefit bills and spoke scathingly of the danger inherent in federal laws which would lead to bureaucratic management of state affairs by the national government. Furthermore, that unless the present tendency to interference with state affairs is checked, the foundations of democratic government will be shaken. He argued convincingly that state government must be maintained so far as compatible with national safety. He spoke of the great burden to the state incident to the care of those who cannot care for themselves, showing that about sixteen million dollars are expended annually for these dependents. Quoting Lord Beaconsfield, he said that "Public health is the first concern of the state," and physicians can be of great assistance in eliminating degeneracy.

In introducing Dane Professor of Law in Harvard University, Samuel Williston, the President quoted the Latin adage, "*De minimis non curat lex*," rearranging the words and the translation in a witty way. The pro-

fessor acknowledged his ready acquiescence in the purpose of the President to present him properly sacrificed, and went on to explain the early principles of law, showing the absurdity of that type of law that applied a penalty for an act without taking into account intent or accident. Many amusing illustrations were detailed and the comparison made between the law of the time of the Puritans and the present day, and the change from law according to the letter for just interpretation of the meaning of documents and moral responsibility of behavior.

The President then told of his disappointment in not having the Rev. W. L. Sperry present, who had been detained by illness. He brought the exercises to a close by a brief address. Feeling the need of some remarks which might supply the void resulting from the absence of a clergyman, he said that he would attempt to lead the thoughts of the audience into religious channels, as did his predecessor of a year ago, who, finding himself without a clergyman, valiantly came forward with his own grace before meat, so that he would suggest a text to be found in the fourth chapter of Paul's Epistle to the Hebrews, fourteenth verse: "Let us hold fast our profession."

Paul does not categorically define the word profession but the inference from the context and the modern definition leads us to believe that what he meant was a profession of faith. We as physicians may contend that ours is a profession of practice quite as much as of faith. Is there, however, any difference in fact? Must we not practise what we preach, and do we not preach that the profession must be according to our faith? However we may define and interpret the exhortation of Paul and later dictionary teaching, can it be maintained that the rank and file of our profession are constantly and zealously holding fast to our profession?

There are several concrete questions which we may ask ourselves.

*First:* Is there any possible foundation for the assertion frequently made by our enemies that there exists a medical trust, composed of members of a so-called profession whose sole aim, however, is self-aggrandizement and trade monopoly?

*Second:* Do our medical schools function too largely for the sublimation of science and for the turning out of a limited number of graduates, individually dedicated to the pursuit of a microcosmic specialty, and too little for the development of practitioners who shall be counterparts in personality of the ones St. Paul had in mind when he wrote of Luke, the beloved physician?



**Third:** Is there an unfortunate tendency on the part of those of us who dwell in the comforts supplied by the luxuries of modern equipment to cultivate a feeling of conscious superiority toward others without these advantages, who are doing high-grade pioneer work under adverse conditions at the periphery?

**Fourth:** Is there a continuing failure on our part to take account of the undoubted prevalence of trifling disorders of mind and body susceptible of cure by simple measures of relief which, if quietly carried out, would redound to the dignity of our calling, which now unquestionably suffers by invidious comparisons with the activities of a flourishing band of charlatans?

**Fifth:** Is an unrestricted spread of "group practice" and "pay clinics" likely to result in unpleasant aspersions to the effect that the emoluments on the professional side have a prominence somewhat out of proportion to the benefits accruing to the clientele?

**Sixth:** Do we keep constantly enough in our minds Theobald Smith's dictum that "It is easier to arouse the nervousness of the public than to allay it"; that whenever practice outruns the laboratory and, more or less impatient, applies the latter's results to the prevention and cure of the disease, it frequently deals with half truths whose application may be harmful; and should not this sense of being surrounded with half truths stimulate us all not to rest content with them, but rather to use our efforts unremittingly until they have been made whole?

**Seventh:** Are the rural districts being left more and more without adequate medical attendance, partly because of a failure of the medical schools to teach and the student body to divine that there is more solid satisfaction to be gained in unselfish service to the sick and to the community than there is to the assiduous devotion to the flesh-pots of Egypt and the sophistical discursion of laboratory findings? In more than one hamlet in the commonwealth, in more than twenty, you might hear reechoed the lamentation of the prophet Jeremiah: "Is there no balm in Gilead? Is there no physician there? Why, then, is not the health of the daughter of my people recovered?"

Now, my brethren, it is not I who am asking these questions. In one form or another they are in everybody's mind, and if any man amongst you doubts it he had better leave his closet and put his ear to the ground.

"Lest you forget"! Hebrews, fourth chapter, fourteenth verse: "Let us hold fast our profession."

## Miscellany.

### THE BOSTON DISPENSARY HEALTH CLINIC.

THE following circular has been distributed by the Boston Dispensary:

Of the first 400 individuals who came to this clinic for a general physical examination, 320 were presumably well. In their own opinion, and to all appearances, there was nothing the matter with them: they came—not for treatment of ills real or imaginary—but because common sense told them that the body, however perfectly it may seem to function, is entitled at least to the attention given an automobile, or a bicycle, or any other machine. They came to be looked over—as an ordinary precaution.

#### What happened?

Exclusive of eye, ear, nose and throat—not counting minor troubles affecting these organs—316 of these individuals were found to have physical defects requiring treatment.

Almost half of them confessed to bad health habits.

Factors well recognized as leading to organic disease were shown in 30 per cent. of them.

#### Why?

Despite the increasing span of life, and the more and more evident desire of the average man to live longer, as social attractions are enhanced, indifference to the preservation of health continues to be the habit of the average as well as the exceptional intelligence. It is a very simple truth that attention follows interest, but it is a rather curious truth that interest, in the case of health, follows affliction. There is the paradox.

The Boston Dispensary Health Clinic provides expert medical examination and advice for wage earners who are troubled about their health, or who want to prevent trouble.

#### What To Do Before You Get Sick.

Illness means that the machinery of the body is somewhere out of order. Most people do not go to the doctor until this happens. No sense to that. Every grownup person ought to have a medical examination at least once a year, whether sick or well, to learn the condition of the body.

Some people think it's the doctor's business to "find something wrong." It isn't. *His real job is to prevent disease, not cure it.* But if he doesn't see the machine until it's out of order, how can he?

#### At the Boston Dispensary You Get:

1. A thorough, general physical examination.



2. Examination by an eye specialist.
3. Examination by a specialist in the ear, nose and throat.
4. Consultation with other specialists, when necessary.
5. Laboratory tests of urine and blood.

*The findings of the specialists and of the laboratory are brought to the physician in charge of the clinic, and he explains these findings to the patient and gives his advice.*

*The Cost:* Five dollars for the complete examination. The service, however, is not in proportion to this charge, which is purposely fixed within reach of the means of those for whom the Clinic is intended. X-ray or other special examinations can be provided for moderate additional fees. Two visits to the Clinic are usually necessary.

Persons are received either for general examination as a measure of prevention, or for advice upon their physical condition or symptoms. The "patient" may come upon his own initiative, or at the request of his family physician. The report will be rendered to the family physician if desired.

No treatment is given in the Clinic.

#### *Hours and Arrangements.*

The Health Clinic is open on Monday, Wednesday and Friday evenings at the Boston Dispensary, 25 Bennet Street. The first examination is made by appointment.

All records, reports and examinations are held in strict confidence.

It is necessary that each person attending the Clinic fill out in advance a form giving information for the doctor's use. These "history blanks" may be obtained and appointments made at the Dispensary between 9 and 5 any week day, or on one of the evenings above mentioned, or by writing the Dispensary and enclosing return postage. Appointments may also be made by telephone.

*Address:* Boston Dispensary Health Clinic, 25 Bennet Street, Boston. Telephone Beach 4280.

### **Correspondence.**

A LETTER FROM MAJOR GENERAL  
LEONARD WOOD, M.D.

Manila, May 9, 1922.

Mr. Editor:

Your letter of March 21st received on April 26th. I am inclosing copies of two letters which I think will prove interesting to the readers of the *Boston Medical and Surgical Journal* and hope that both the letter and its answer may be given wide publicity, as it will, perhaps, tend to check the unthinking and dangerous attacks which are made upon vaccination from time to time.

Wherever vaccination has been carried out care-

fully in the Philippine Islands, smallpox has practically disappeared. Wherever it has been neglected or inefficiently done, we have had frightful loss of life. The people, who are familiar with the situation, are keenly appreciative of the benefits of vaccination.

The general health situation is complex and difficult. The Philippines are greatly in need of doctors, nurses, and well-trained sanitary inspectors. Efforts are being made to encourage the study of medicine and surgery and to greatly increase the number of nurses and sanitary inspectors. With approximately 11 million people, we have less than 11 hundred trained nurses, about 12 hundred physicians and surgeons, and altogether too few well trained sanitary inspectors. We need at least three times the number of nurses we now have and a very great increase in the number of well-educated medical men. Arrangements are being made for a brief intensive course of training for sanitary inspectors.

A medical survey of the islands is being made under the direction of the Rockefeller Foundation, and steps are being taken to give widespread instruction to the people in food values and to correct the tendency to use too much polished rice, to which is traceable directly fifty per cent. of the heavy annual infant death rate from infantile beriberi. The present infantile death rate is very heavy; about one-third of all children born die in the first year.

We are also reorganizing the great leper colony at Cullion of over 5,000 lepers, so that better and more extensive treatment of the lepers may be possible, and the results made available for the medical profession everywhere.

There is a growing interest among the people, in sanitary matters, and no efforts are being spared to build up an appreciation of the value of preventive medicine and sanitation.

There is an excellent field for the medical missionary and the small well equipped and maintained hospital in the Philippines. The hospitals which have been established by the various churches and missionary organizations are all much appreciated, and are doing good work and have been of great value in supplementing the vigorous efforts of the government. They meet, however, only in part the demands of the situation. Arrangements for the better care and treatment of the insane are also under consideration. The institutions at present in use are largely lacking in the facilities of proper treatment. Much was done while Wm. Cameron Forbes was Governor-General to improve the water supply through the provision of many artesian wells, but an adequate supply of pure water is still one of the great problems.

The Filipinos are naturally a healthy people and their houses so built that they have ample ventilation, but there is, nevertheless, a good deal of tuberculosis. We have also a difficult problem to deal with in controlling malaria.

I have but indicated some of the medical and sanitary problems, but I am sure I have said enough to indicate that there is plenty to do for the dietitian, the sanitarian and the medical profession generally.

Very sincerely yours,

LEONARD WOOD.

#### THE AMERICAN HUMANE ASSOCIATION.

Albany, N. Y., March 22, 1922.

Major-General Leonard Wood,  
Governor-General, Philippine Islands,  
Manila, P. I.

Dear General Wood:

Sometime since I wrote to you in regard to the matter of feeding live animals to the snakes in the

Manila Zoo, and recently someone sent me a newspaper clipping, stating that you had forbidden the practice as far as it affected dogs. You promised an additional note of information but it was not received in our office. Doubtless you are very busy.

A correspondent in Tampa, Florida, has just sent me a clipping which discusses the matter of small-pox vaccination in the Philippines. It states:

"In 1918 the Philippine Health Service shot 3,286,376 slugs of pus into that number of Filipinos and reaped a harvest of 47,300 cases of smallpox with 10,447 deaths."

"In 1919 they improved the service and delivered 7,070,252 pus puncheries into their brown brethren and reaped a harvest of 65,180 cases of smallpox with 44,408 deaths."

I have no means of determining the truth of such a statement. If you can put me in the way of getting definite and reliable facts in regard to the conditions referred to, I shall be very glad to have the information.

Hoping that you are well and realizing that you will do everything to make good for our Filipino brethren, I am,

Faithfully your friend,  
(Sgd.) W. O. STILLMAN,  
President.

P. S.—Does the above mean that the vaccination was a failure? I am a physician. S.

#### OFFICE OF THE GOVERNOR-GENERAL OF THE PHILIPPINE ISLANDS.

Manila, April 29th, 1922.

Dear Dr. Stillman:

Your letter of March 22nd, quoting statement from a correspondent in Florida, which would seem to throw doubt upon the efficacy of vaccination, has just been received. The real facts are diametrically opposite; instead of there being any doubt as to the value of vaccination against smallpox it has been doubly confirmed.

According to the reports of the Philippine Health Service, 1918, there have been even a larger number of deaths reported than quoted by your correspondent. When the records are analyzed they show that something like 90 per cent. of the deaths occurred in children, most of whom were born since 1913. The records show that vaccination has been steadily continued since 1913, but on investigation it was found that, owing to the inefficient inspection, vaccination consisted mostly in destroying the vaccine and submitting reports to the main office that it had been applied. In brief, a huge unvaccinated population had accumulated in the Philippines; it only required a spark to set it into conflagration, and in a short time a smallpox epidemic began among these unvaccinated children which assumed huge proportions, and eventually gained such virulence that it affected persons who, under ordinary conditions, would have been safe. The figures of the City of Manila bear out this statement in a striking manner. Among 980 deaths that were recorded all but 100 occurred in children under 10 years of age. Again, of 1826 cases received at the Manila Infectious Disease Hospital, 813 had never been vaccinated, and of these 680 died; 336 had been vaccinated with negative results; of these 249 died. Of the total 1826 cases received at the hospital only 176 had evidence of vaccination, many of which were undoubtedly performed many years prior to the attack of the disease. Among this number there were 60 deaths. During 1919 more effective vaccina-

tion was begun, and there was such a decline in the smallpox epidemic that by 1920 there were only 5 cases in Manila, and none in 1921.

From the accompanying table it will be seen that after effective vaccination had been established in the city of Manila there were no deaths for seven years. It is also interesting to observe that before the days of systematic vaccination in the Philippine Islands that there were approximately 40,000 deaths per year from smallpox. As effectual vaccination was carried out the disease disappeared province by province.

It is apparent, therefore, that the foregoing information makes concrete proof of the value and desirability of vaccination when it is effectually applied.

I note your request with regard to the feeding of snakes in the Manila zoo, and I hope at a later date to be able to furnish you the information requested. The use of dogs has been stopped.

Yours very sincerely,

(Sgd.) LEONARD WOOD.

Dr. William O. Stillman,  
President, American Humane Association,  
Albany, N. Y.

#### DEATHS CAUSED BY SMALLPOX IN THE CITY OF MANILA

Year	GROUP OF AGES										Total
	30da	1yr	2yr	3yr	4yr	5yr	10yr	15yr	20yr	30yr	
1904	3	10	1	1	1	1	1	1	1	1	29
1905	2	1	1	1	1	1	1	1	1	1	12
1906	1	1	1	1	1	1	1	1	1	1	11
1907	1	1	1	1	1	1	1	1	1	1	11
1908	1	1	1	1	1	1	1	1	1	1	11
1909	1	1	1	1	1	1	1	1	1	1	11
1910	1	1	1	1	1	1	1	1	1	1	11
1911	1	1	1	1	1	1	1	1	1	1	11
1912	1	1	1	1	1	1	1	1	1	1	11
1913	1	1	1	1	1	1	1	1	1	1	11
1914	1	1	1	1	1	1	1	1	1	1	11
1915	1	1	1	1	1	1	1	1	1	1	11
1916	1	1	1	1	1	1	1	1	1	1	11
1917	1	1	1	1	1	1	1	1	1	1	11
1918	1	1	1	1	1	1	1	1	1	1	11
1919	1	1	1	1	1	1	1	1	1	1	11
1920	1	1	1	1	1	1	1	1	1	1	11
1921	1	1	1	1	1	1	1	1	1	1	11

#### RECENT DEATH.

DR. EDWARD HALL NICHOLS, Professor of Clinical Surgery, Harvard Medical School, and Visiting Surgeon Boston City Hospital, died of cerebral hemorrhage at his home in Boston, June 12, 1922, at the age of 58.